

**SONY®**

DIGITAL VIDEOCASSETTE PLAYER

**DNW-A22/A22P**

**BETACAM SX**

MAINTENANCE MANUAL Part 1

1st Edition (Revised 1)

Serial No. 10001 and Higher (DNW-A22)

Serial No. 10001 and Higher (DNW-A22P)

## ⚠️ 警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理など行うと感電や火災、人身事故につながることがあります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

## ⚠️ WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

## ⚠️ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegebenen Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

## ⚠️ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

**Attention-when the product is installed in Rack:**

**1. Prevention against overloading of branch circuit**

When this product is installed in a rack and is supplied power from an outlet on the rack, please make sure that the rack does not overload the supply circuit.

**2. Providing protective earth**

When this product is installed in a rack and is supplied power from an outlet on the rack, please confirm that the outlet is provided with a suitable protective earth connection.

**3. Internal air ambient temperature of the rack**

When this product is installed in a rack, please make sure that the internal air ambient temperature of the rack is within the specified limit of this product.

**4. Prevention against achieving hazardous condition due to uneven mechanical loading**

When this product is installed in a rack, please make sure that the rack does not achieve hazardous condition due to uneven mechanical loading.



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# Manual Structure

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## Purpose of this manual

This manual is the maintenance manual part1 of the digital videocassette player DNW-A22/A22P.

This manual is intended for use by trained system and service engineers, and provides the information that is required to install, maintenance information, and the information for service such as replacement of plug-in boards.

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## Contents

This manual is organized by following sections.

### **Section 1 Installation**

Explains the information that is required to install (environment, connection information, initial setting, etc.).

### **Section 2 Service Overview**

Explains fundamental area of the information that is required to service, (removal of cabinet and cassette compartment, the functions of printed circuit board, the locations of main part, fixture and measuring equipment information, notes, etc.), the measures against trouble and ISR (Interactive Status Reporting).

### **Section 3 Error Message**

Explains the error messages.

### **Section 4 Maintenance Mode**

Explains each menu of the maintenance mode.

### **Section 5 Periodic Maintenance and Inspection**

Explains the recommended periodic maintenance, and the cleaning procedure.

### **Section 6 Replacement of Plug-in Boards**

Explains how to replace the plug-in board and how to adjust and check after replacement.

### **Section 7 Spare Parts**

Describes the spare parts list and the exploded view for the service parts of this unit, and the packing materials and supplied accessories list.

### **Appendix A Setting Check Sheet**

The sheet is used for checking the setup conditions such as switch, setup menu under the application.

### **Appendix B Block Diagrams**

Describes the overall block diagrams

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## Related manuals

Besides this “maintenance manual part 1”, the following manuals are available for digital videocassette player DNW-A22/A22P.

- **Operation Manual (Supplied with this unit.)**

This manual is necessary for application and operation (and installation) of this unit.

- **Maintenance Manual Part 2 (available on request )**

This manual describes the information that premises the parts level service (adjustments, board layouts, schematic diagrams, detailed parts list, etc.) for this unit.

If this manual is required, please contact to Sony's service organization.



# Section 1

## Installation

### 1-1. Installation Procedure

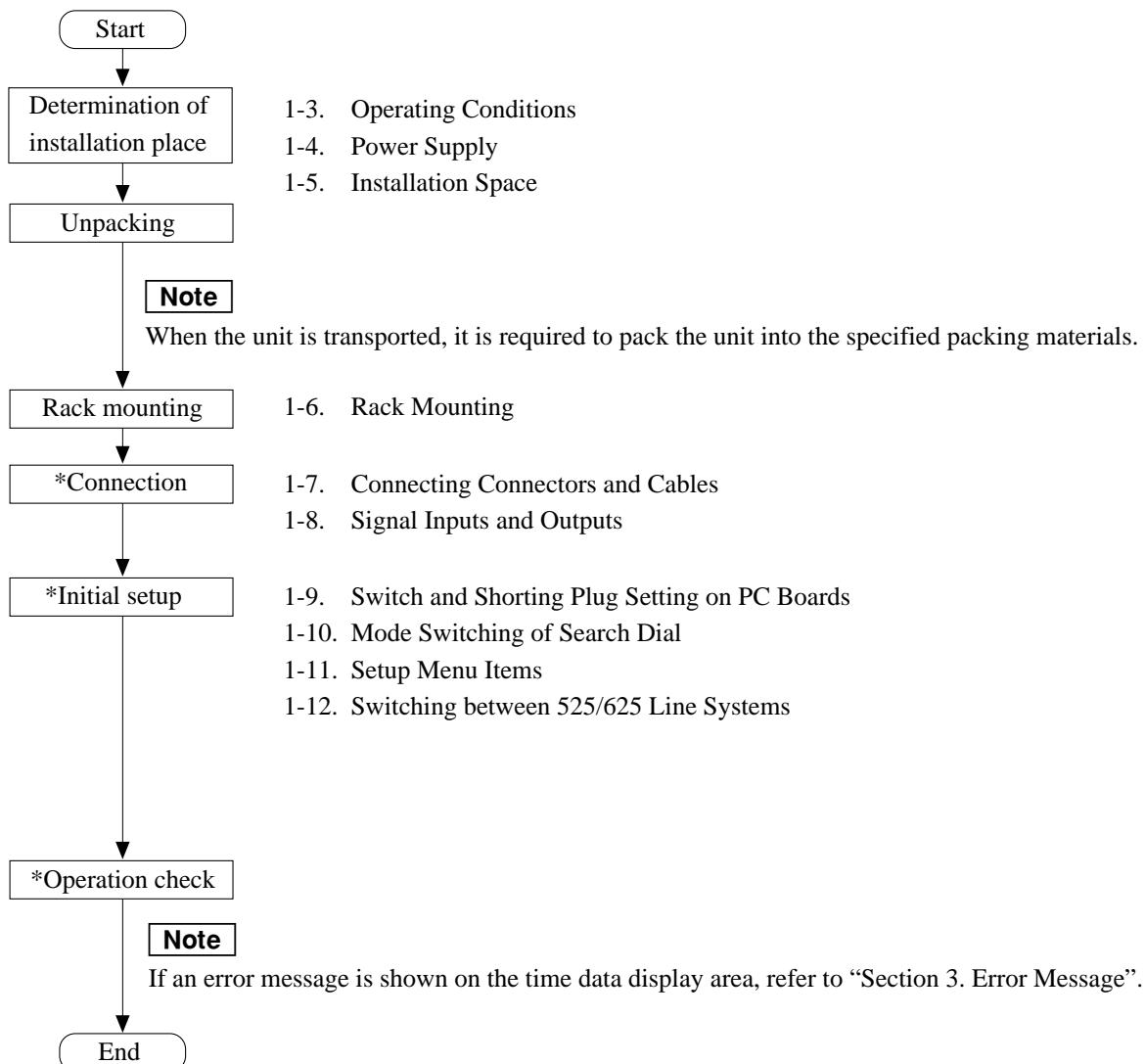
Installation procedure of this unit is shown on the following flowchart.

Refer to each section about detail of each flow.

The operation manual is also required to do \* - marked items.

### 1-2. Supplied Accessories

Screws for rack mounting (PSW 4 × 16) .....	4
Operation manual .....	1
Maintenance manual (Part 1).....	1



## 1-3. Operating Conditions

### CAUTION

Good air circulaiton is essential to prevent internal heat build-up. Place the unit in location with sufficient air circulation.

Do not block the ventilation holes of the cabinet and the front and rear panels.

Operating temperature: 5°C to 40°C

Operating humidity: 25 % to 80 %  
(Condensation not allowed)

Storage temperature: -20°C to 60°C

Locations to avoid:

- Areas where the unit will be exposed to direct sunlight or any other strong lights.
- Areas near heat sources.
- Dusty areas or areas subject to vibration.
- Areas with strong magnetic field.
- Areas with much electrical noise.
- Areas with much static electricity.
- Areas that is impossible to find a specified room for installation.  
(Refer to "1-5. Installation Space" on page 1-3.)
- Areas windtight.

Horizontal condition: Do not slant the front or rear of the unit more than 30°.

### CAUTION

Fix the unit securely to avoid slipping if the unit is not operated at horizontal place.

## 1-4. Power Supply

### 1-4-1. Voltage and Power Requirements

### WARNING

Be sure to operate the unit within the range of following power voltage.

Power voltage: AC 100 to 240 V ±10 %

Power frequency: 50 Hz or 60 Hz

Power consumption: 190 W (190 VA)

Rush current: Power voltage 100 V IN; 10 A  
Power voltage 240 V IN; 20 A

This unit's power line has a switching regulator with the power factor 98%.

### Note

AC power supply is required a capacity which is commensurate with rush current.

If the capacity of the AC power supply is not enough, the breaker of AC power of a supply side may operate or this unit may not operate normally.

### 1-4-2. Power Cord

### WARNING

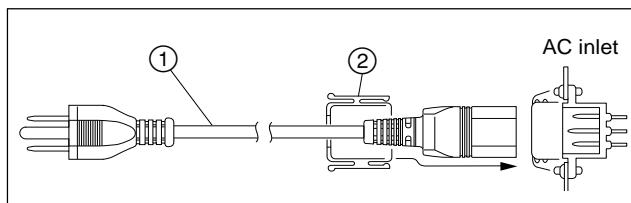
Use the specified power cord only when connecting.  
Never use a injured power cord.

Power cord for the customer in the U.S.A. and Canada.

① Power cord (approx. 2.4 m) △1-557-377-11

② Plug holder (Black) 2-990-242-01

Please consult with local Sony's service office.

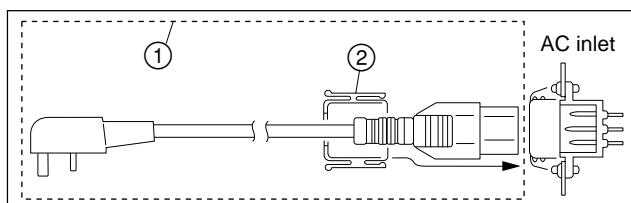


Power cord for the customer in the United Kingdom.

① DK-2401(UK) (approx. 2.4 m)

② Plug holder (Black) 2-990-242-01

Plug holder is included in DK-2401(UK).

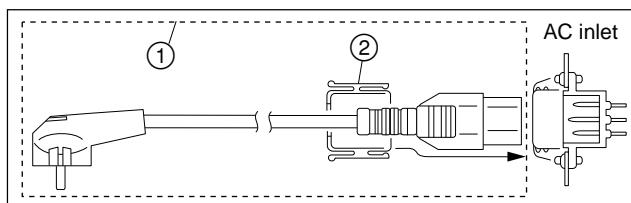


Power cord for the customer in Europe except the United Kingdom.

① DK-2401(AE) (approx. 2.4 m)

② Plug holder (Black) 2-990-242-01

Plug holder is included in DK-2401(AE).



If the unit is used in the area except above, please consult with local Sony's sales/service office.

## 1-5. Installation Space

When installing, the installation space must be secured in consideration of the ventilation and service operation.

- Do not block ventilation (upper lid, right side panel, lower portion of front panel and bottom plate) and exhaust part.
- Leave a space around the unit for ventilation.
- Leave a space more than 40 cm at the rear side of the unit to secure the operation area.

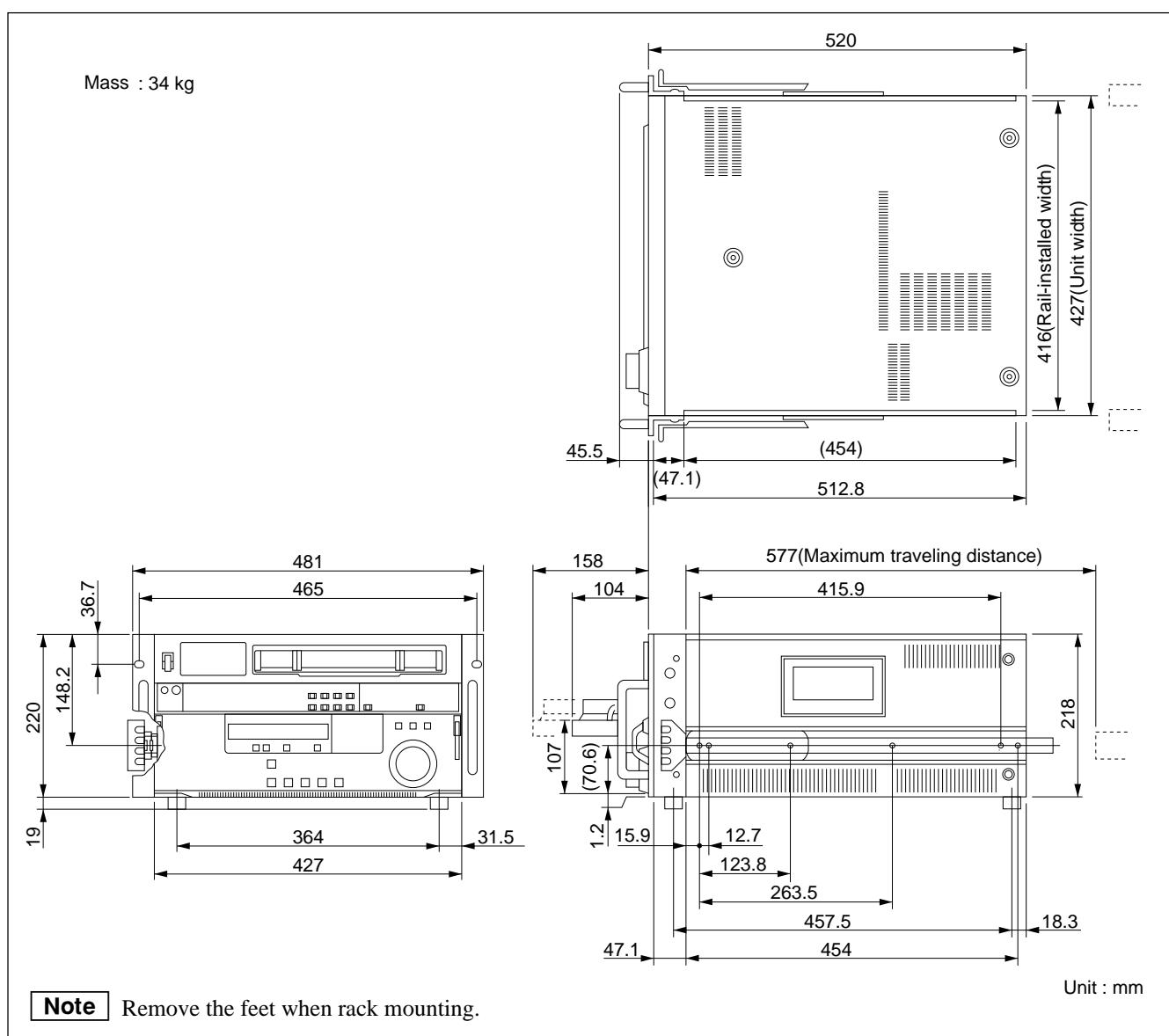
When the unit is installed on the desk or similar condition, assure that the clearance at the upper and right sides is at least 4 cm. However, it is recommended that the clearance above the unit is more than 40 cm in consideration of the service operation.

When the unit is mounted in the rack, leave a space on the top and bottom of this unit by 1U.

Moreover, an air flow that is effective in cooling the unit is essential. If the ventilation is not enough, the unit may be damaged because an increase of the internal temperature of the unit can not reduce.

### Note

This unit is air-cooled by four fans. However for the operation with the upper lid removed, the air cooling effect using the fan decreases. Complete the work in a short time as far as possible when the unit is operated for inspection with the upper lid removed. Blow a wind using an electric fan so as to suppress an increase in temperature when the work is continued for a long time with the power turned on.



## 1-6. Rack Mounting

Explains how to mount this unit in a 19-inch standard rack. Install this unit in a rack accurately as following procedure using specified rack mount rail.

If not, there is a fear of unexpected accident such as a drop of the unit or turnover of the rack.

### CAUTIONS

- Use the specified rack mount rail.  
If not, injury could occur by drop of the unit because strength of rail is not enough.
- To prevent turning over the rack, fix the rack on the horizontal and firm floor securely using the bolts.
- Adjust so that the temperature inside the rack is in the range of the unit's operating temperature.
- To reduce an increase in the internal temperature of this unit, leave each space on the top and bottom of this unit by 1U.
- Never remove the upper lid, bottom plate, and so on during rack mounting.

### Note

Connect long enough cables on the connector panel, considering that the unit is pulled out from the rack.

### Specified Rack Mount Kit

RMM-111 (Option) or  
RMM-110 (Option)

The color of rack angle of RMM-111 fits to the unit.

RMM-110 is the same consistence, strength and dimension as RMM-111, but the color of rack angle is different.

### Parts Packed in RMM-110/111

- Slide rails ..... 2
- Rack angles (handle) ..... 2
- Rail brackets ..... 4
- Plate nuts (large) ..... 4
- Plate nuts (small) ..... 4
- Screws (PSW4 × 16) ..... 4
- Screws (B4 × 8) ..... 8
- Hexagon socket head cap screws .... 8
- Flat washers ..... 8
- Screws (RK5 × 14) ..... 2
- Ornamental washers ..... 2
- L-shaped hexagon wrench ..... 1

### Rack Mounting Procedure

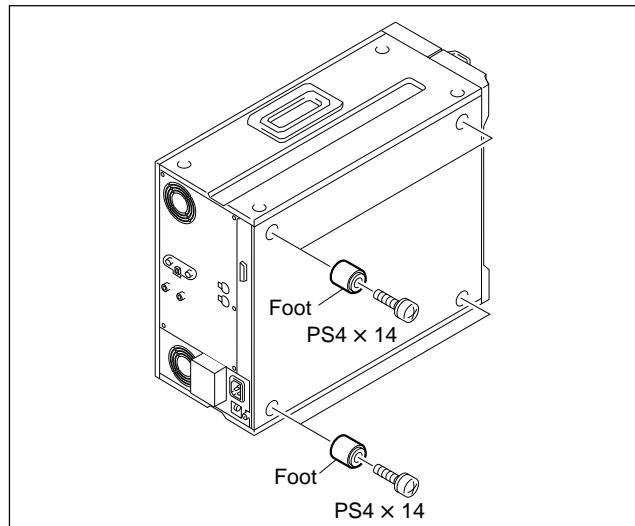
#### • Remove of feet

- (1) Place the unit on its right side panel down.

#### Note

Lend your hand so that the lower handle does not hang down.

- (2) Unscrew the four screws and remove the feet from the bottom plate of the unit.
- (3) Replace the unit to the horizontal position.



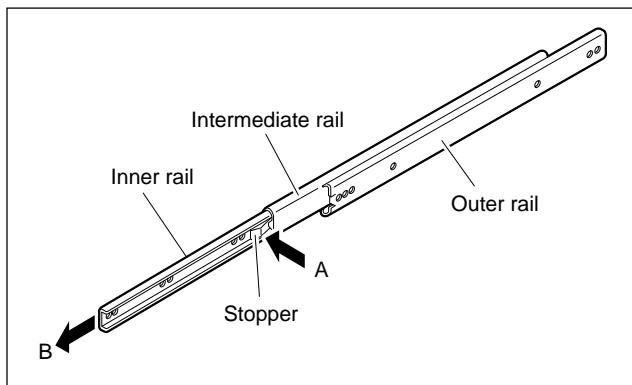
### CAUTION

Keep these screws and the feet that are removed in this procedure carefully.

Tightening torque:  $98 \times 10^{-2}$  N · m { 10 kgf · cm }

#### • Attachment of inner rails

- (4) Pull out the inner rails from the two intermediate rails.
- (5) While pressing the stopper of the inner rail in the direction of the arrow A in the figure, pull out it in the direction of the arrow B. (Pull out the other inner rail in the same way.)

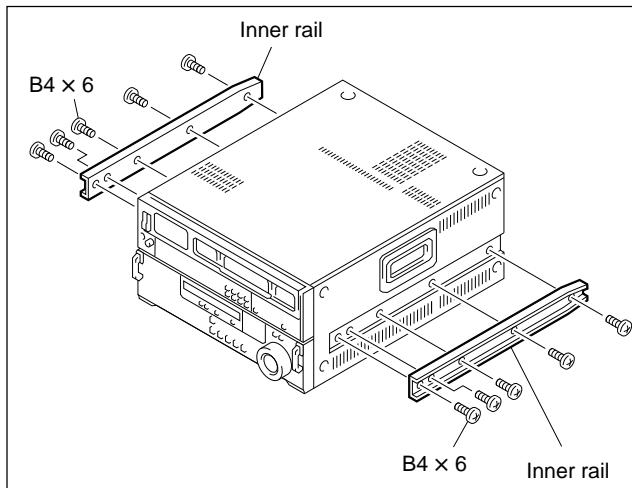


- (6) Remove the ten screws from both sides (left and right) of the unit shown in the figure.
- (7) Attach the two inner rails to both sides (left and right) of the unit using the screws removed in the procedure (6).

Tightening torque:  $120 \times 10^{-2} \text{ N} \cdot \text{m}$  {12.2 kgf · cm}

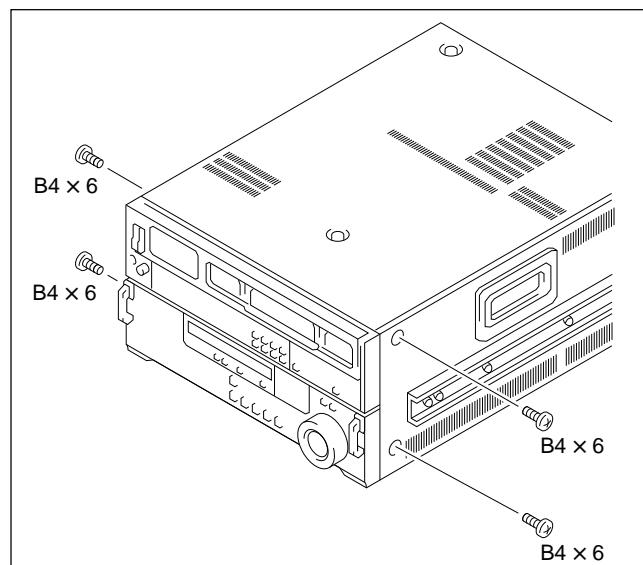
#### Note

Be sure to attach the inner rail using the screws (B4 × 6). If other screws are used, a failure occurs in the operation of the unit.



#### • Attachment of rack angles (handles)

- (8) Remove the four screws (B4 × 6) in the figure from both sides (left and right) of the unit.



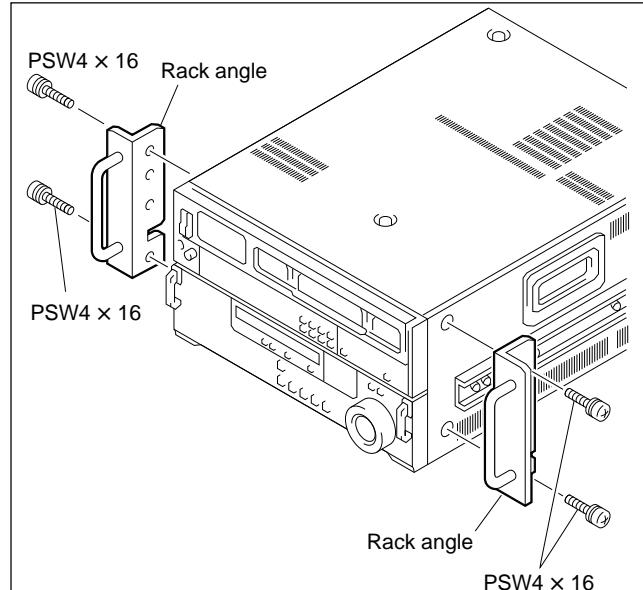
#### Note

Keep these screws (B4 x 6) that are removed in the procedure (8) carefully.

Be sure to use these screws when directly attaching the side panels by screws after removing the rack angles. If the rack angle fixing screws (PSW4 x 16) are used by mistake, a failure occurs in the operation of the unit because they are longer than the (B4 x 6) screws.

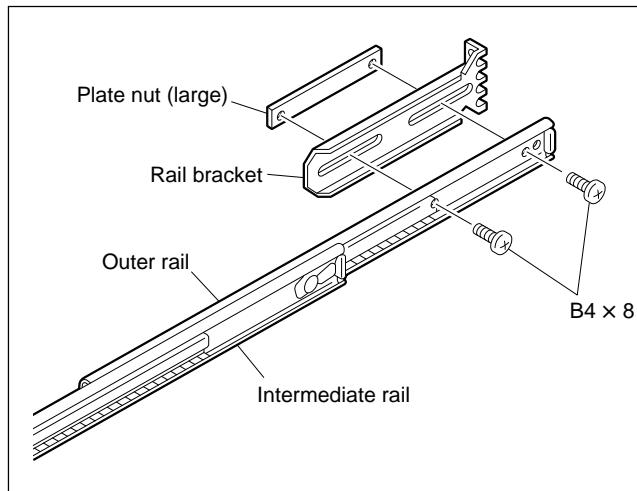
- (9) Attach the two rack angles to both sides (left and right) of the unit using the four screws (PSW 4 × 16) supplied with the rack mount kit.

Tightening torque:  $120 \times 10^{-2} \text{ N} \cdot \text{m}$  {12.2 kgf · cm}

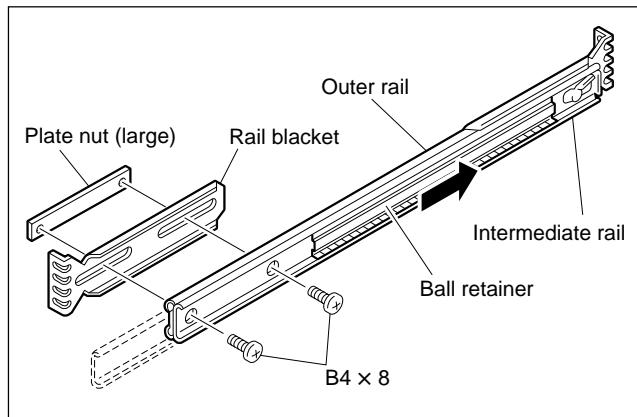


• **Temporary attachment of rail brackets**

(10) Stagger the outer rail and the intermediate rail as shown in the figure. And attach the rail bracket to the outer rail temporarily using the plate nuts (large) and the two screws. (Attach the rail bracket to the other outer rail temporarily in the same way.)



(11) Stagger the ball retainer as shown in the figure . And attach the rail bracket to the outer rail temporarily using the plate nuts (large) and the two screws. (Attach the rail bracket to the other outer rail temporarily in the same way.)

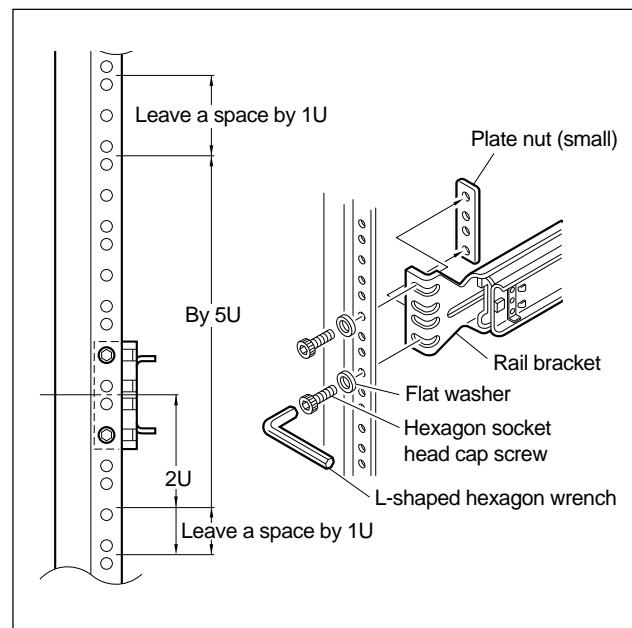


• **Attachment of outer rails**

(12) As shown in the figure, fix the outer rails on both sides (left and right) temporarily to the 2U position from the bottom of the space by 5U for installing this unit, with eight hexagon socket head cap screws and eight flat washers (front and rear, and right and left positions).

**CAUTION**

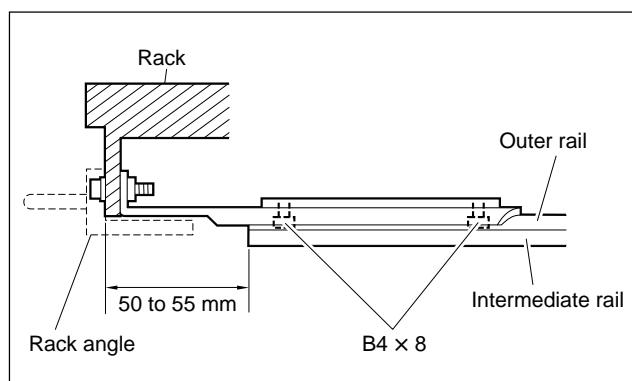
Leave each space on the top and bottom of this unit by 1U to reduce an increase in the internal temperature of this unit.



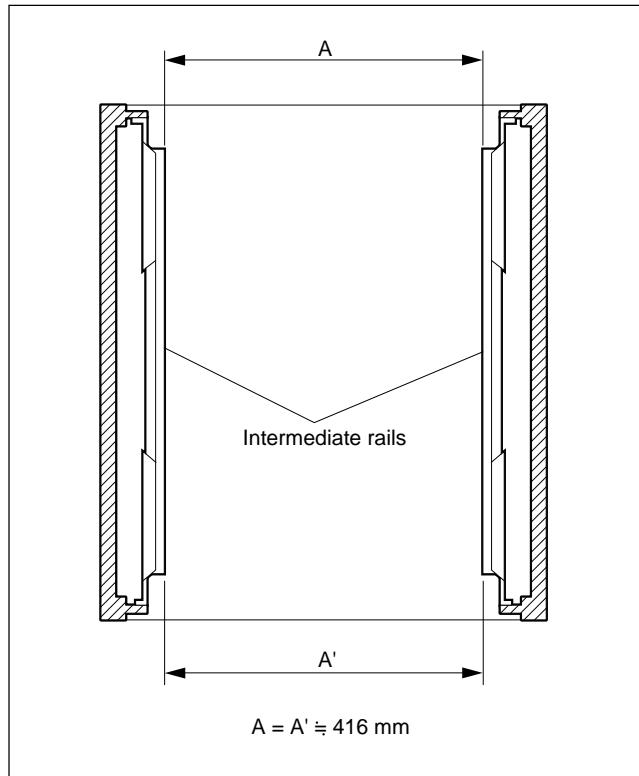
(13) Adjust the position of rails on both sides (left and right) so that the distance from the surface of the rack to the tip of the rail become 50 to 55 mm.

(14) Tighten the screws (four positions, total eight) attaching the rail bracket temporarily using the following tightening torque.

Tightening torque:  $120 \times 10^{-2} \text{ N} \cdot \text{m}$  {12.2 kgf · cm}



- (15) Be sure that the distance between the intermediate rails on both sides (left and right) satisfy the specifications.



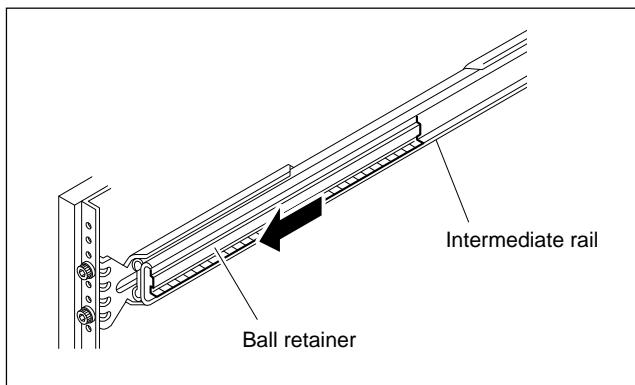
- (16) Tighten the hexagon socket head cap screws (four positions, total eight) attaching the outer rails to the rack temporarily using the L-shaped hexagon wrench.

• **Mounting in rack**

**CAUTION**

Have two or more persons to do this work.

- (17) Stagger the ball retainers of intermediate rails on both sides (left and right) toward you.



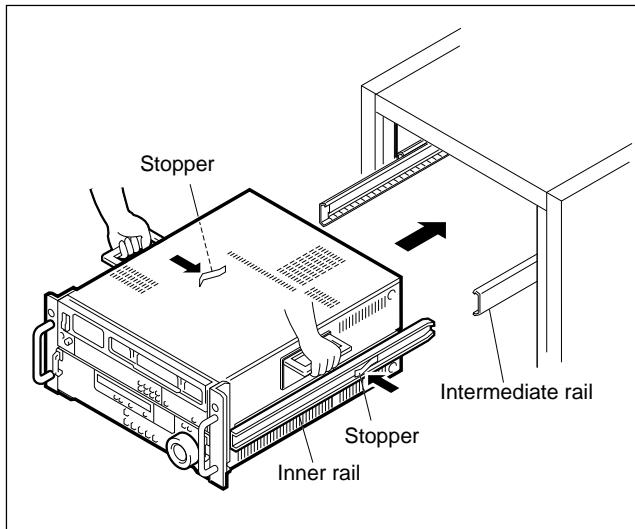
- (18) Pull the rails out equal length from both sides (left and right).

- (19) Lift the unit holding the handles, insert the inner rails into the intermediate rails slowly.

- (20) While pressing the stoppers on the both sides (left and right), push the unit into the rack slowly.

**CAUTION**

Be careful not to catch your finger or hand in rack mount rail.



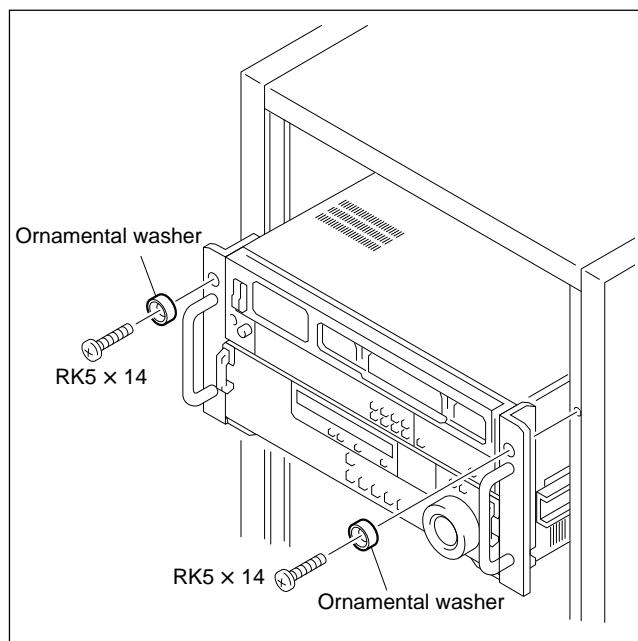
- (21) Take the unit in and out from the rack about three times and be sure that slide rail moves smoothly. If slide rail does not move smoothly, remove the unit and go back to "Attachment of outer rails" (procedure 12).

**CAUTIONS**

- Have two or more persons to remove.
- This unit does not have the feet in this operation. When you put down this unit from the rack, be careful not to give a shock to it.

- (22) Fix the unit to the rack using two screws and two ornamental washers.

Tightening torque:  $120 \times 10^{-2} \text{ N} \cdot \text{m}$  {12.2 kgf · cm}



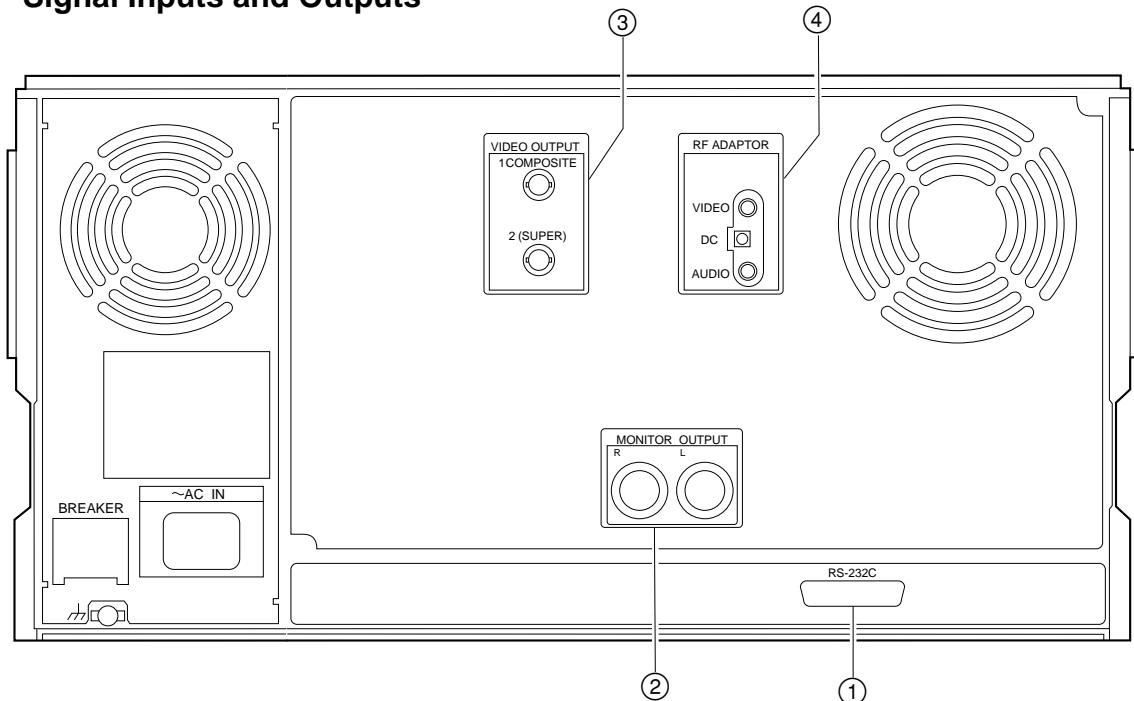
## 1-7. Connecting Connectors and Cables

When external cables are connected to the connector of this unit, the hardware listed below (or the equivalents) must be used.

Panel indication	Maching connector (cable)	Sony part No.
VIDEO OUTPUT	BNC 75Ω, MALE	—
MONITOR OUTPUT	XLR 3P, FEMALE	1-508-083-00
RS-232C	D-SUB 25P, MALE	1-566-356-11
PHONE <small>(Note1)</small>	JM-60 stereo phone plug	—
RFU OUT VIDEO	RFU adaptor AV cable	—

Note 1: It exists on the front (upper control panel) .

## 1-8. Signal Inputs and Outputs



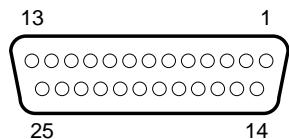
### Communication connectors

① RS-232C	D-SUB 25P connector (RS-232C interface) for ISR (Interactive Status Reporting)
-----------	---



### Output connectors

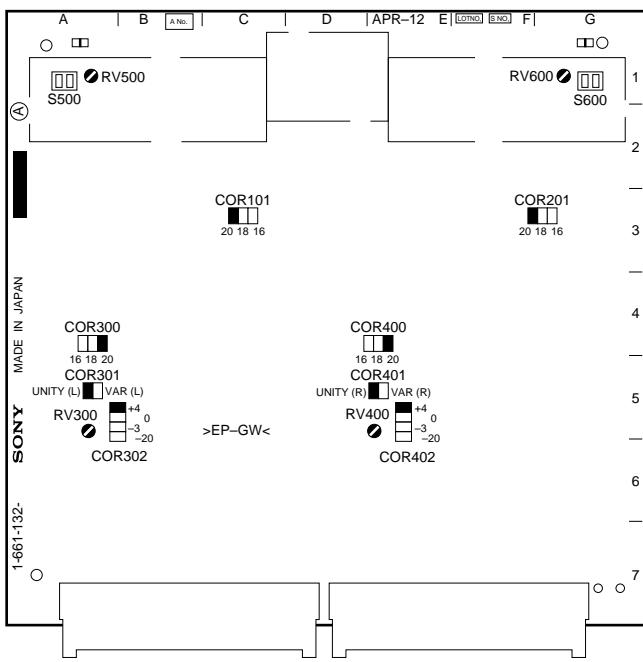
② MONITOR R/L	XLR 3-pin × 2 Analog audio +4 dBm (Standard) (600 Ω load), low impedance, balanced
③ COMPOSITE VIDEO	BNC × 2 (including 1 for character superimpose) Analog composite video 1.0 V p-p, 75 Ω, sync negative
④ RF ADAPTOR	VIDEO : RCA jack, 1.0 V p-p, 75 Ω, sync negative (for character superimpose) DC : 5 V AUDIO : RCA jack, -10 dBu, high impedance, unbalance
PHONE (Upper control panel)	JM-60 stereo phone jack Analog audio Up to -12 dBu (8 Ω, load), unbalance

**RS-232C: 25-pin (female)****〈External view〉**

<b>Pin No.</b>	<b>Signal</b>
1	FG ; Frame Ground
2	TXD ; Transmitted Data (Output)
3	RXD ; Received Data (Input)
4	RTS ; Request to Send (Output)
5	CTS ; Clear to Send (Input)
6	DSR ; Data Set Ready (Input)
7	SG ; Signal Ground
8	DCD ; Data Carrier Detect (Input)
9 to 19	NC
20	DTR ; Data Terminal Ready (Output)
21 to 25	NC

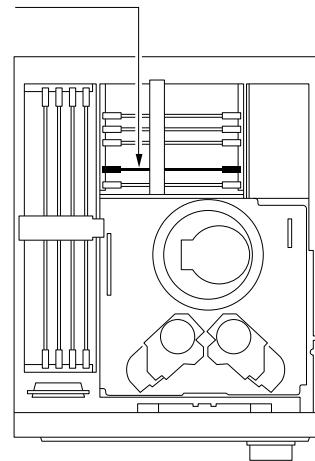
## 1-9. Switch and Shorting Plug Setting on PC Boards

### 1-9-1. APR-12 Board



#### Note

Refer to “2-13. Pulling Out/Insertion of Plug-in Board” for pulling out and insertion of board.



#### HEAD TUNE switch (For Betacam/Betacam SP longitudinal audio playback)

It is not necessary to change the setting of these switches, when installing.

Channel	Ref. No.	Description
CH1	S500	By coupling with RV500, adjust the CH1 head amp high frequency response. This switch is used in audio head dumping adjustment. When the unit is shipped, this switch is set to the position based on the adjustment condition.
CH2	S600	By coupling with RV600, adjust the CH2 head amp high frequency response. This switch is used in audio head dumping adjustment. When the unit is shipped, this switch is set to the position based on the adjustment condition.

### Audio input headroom setting (For Betacam/Betacam SP longitudinal audio playback)

Channel	Ref. No.	Display	Input headroom (dB) [ ]: Factory setting		
			[20]	18	16
CH1	COR101	20	Short	Open	Open
		18	Open	Short	Open
		16	Open	Open	Short
CH2	COR201	20	Short	Open	Open
		18	Open	Short	Open
		16	Open	Open	Short

### Monitor output level setting

Channel	Ref. No.	Display	Output level (dBm/600 Ω) [ ]: Factory setting				Fine adjustment
			[+4]	0	-3	-20	
L	COR302	+4	Short	Open	Open	Open	RV300
		0	Open	Short	Open	Open	
		-3	Open	Open	Short	Open	
		-20	Open	Open	Open	Short	
R	COR402	+4	Short	Open	Open	Open	RV400
		0	Open	Short	Open	Open	
		-3	Open	Open	Short	Open	
		-20	Open	Open	Open	Short	

### Monitor output headroom setting

Channel	Ref. No.	Display	Output headroom (dB) [ ]: Factory setting			Fine adjustment
			[20]	18	16	
L	COR300	20	Short	Open	Open	RV300
		18	Open	Short	Open	
		16	Open	Open	Short	
R	COR400	20	Short	Open	Open	RV400
		18	Open	Short	Open	
		16	Open	Open	Short	

### Selecting fixed or variable monitor output level

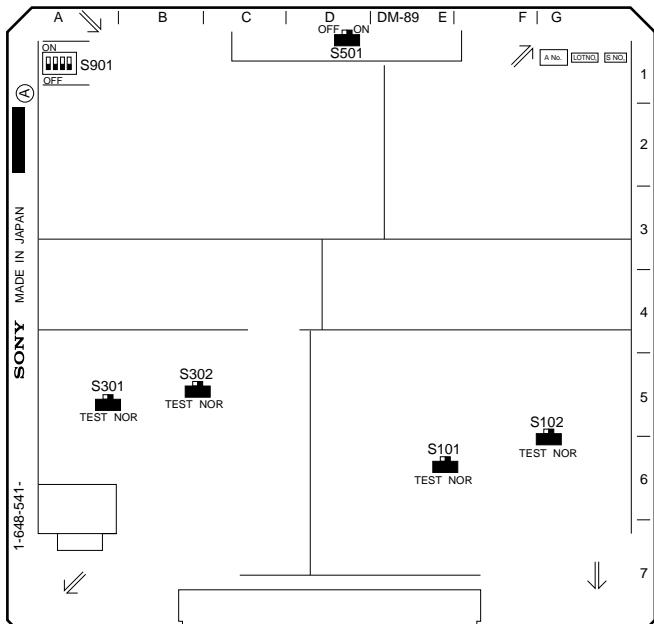
When the level variable is selected, the level is adjusted with the PHONE level control.

Channel	Ref. No.	Display	Monitor output level [ ]: Factory setting		
			[Fixed]	Variable	
L	COR301	UNITY(L)	Short	Open	
		VAR(L)	Open	Short	
R	COR401	UNITY(R)	Short	Open	
		VAR(R)	Open	Short	

## 1-9-2. DM-89 Board

### Note

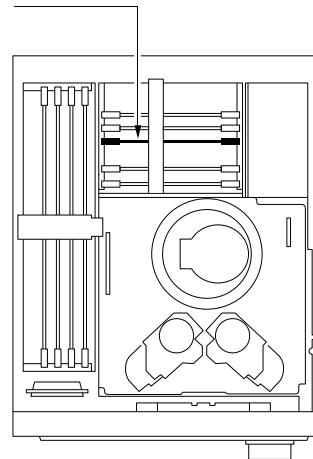
Never change the settings of the factory use switches.



DM-89 Board (A Side)

### Note

Refer to “2-13. Pulling Out/Insertion of Plug-in Board” for pulling out and insertion of board.



< Top View >

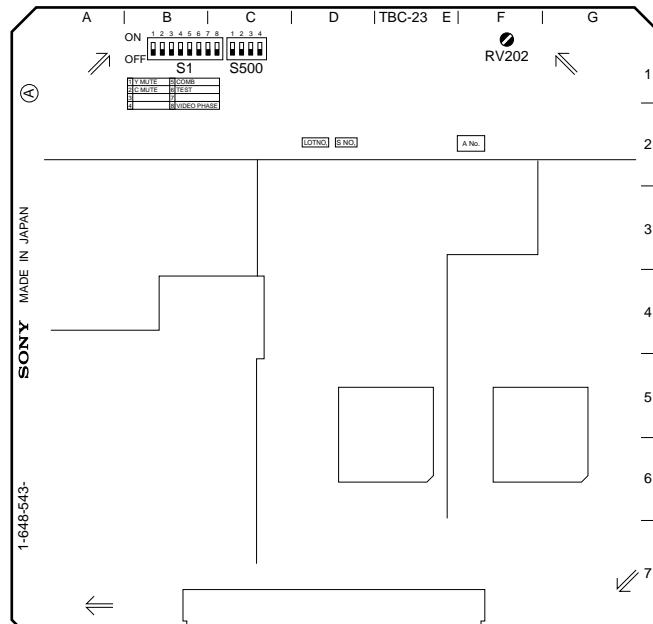
### DM-89 board switch

Switch No.	Name	Description	Factory setting
S101	Y-RF LPF & EQ TEST (Y-RF low-pass filter & equalizer test)	Y-RF low-pass filter & equalizer test signal connection switch To adjust: Select the TEST position. Connect the input signal to TP103. (GND to E102)	NORMAL POSITION
S102	_____	Factory use	NORMAL POSITION
S301	C-RF LPF & EQ TEST (C-RF low-pass filter & equalizer test)	C-RF low-pass filter & equalizer test signal connection switch To adjust: Select the TEST position. Connect the input signal to TP303. (GND to E302)	NORMAL POSITION
S302	_____	Factory use	NORMAL POSITION
S501	_____	Factory use	ON
S901 1 to 4	_____	Factory use	OFF (OPEN)

### 1-9-3. TBC-23 Board

**Note**

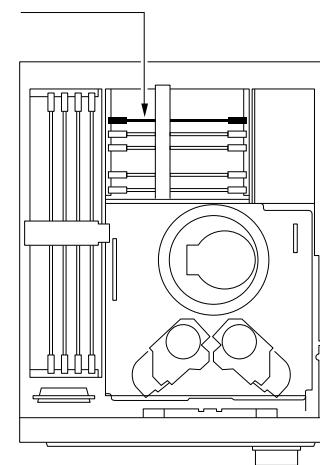
Never change the settings of the factory use switches.



TBC-23 Board (A Side)

**Note**

Refer to “2-13. Pulling Out/Insertion of Plug-in Board” for pulling out and insertion of board.



< Top View >

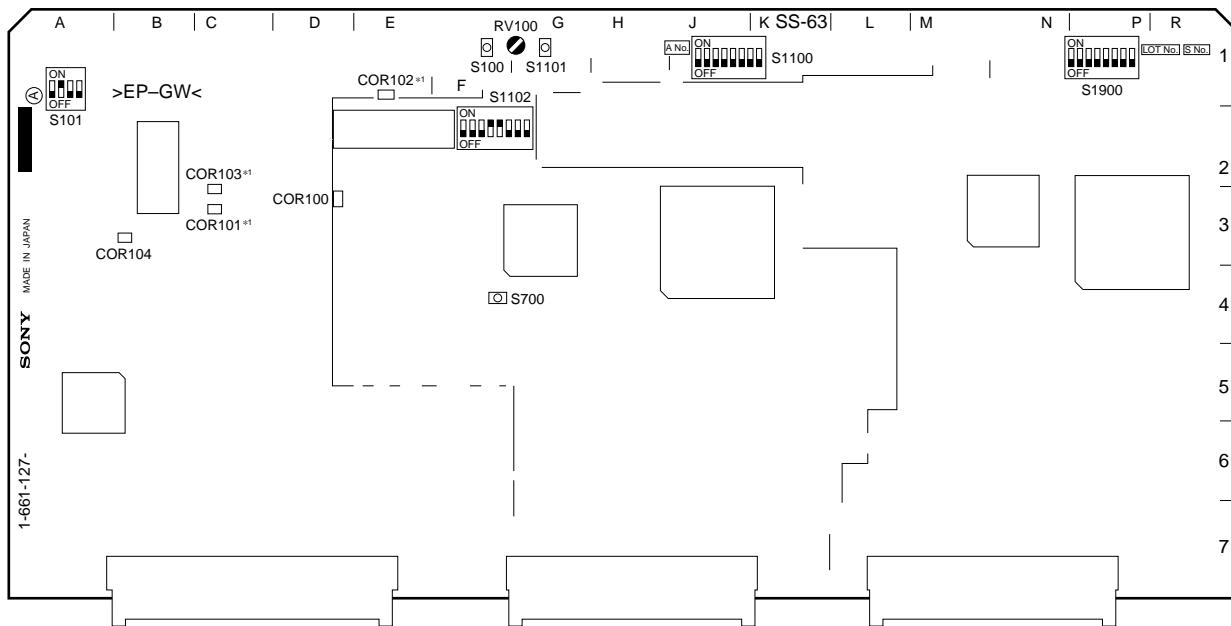
#### TBC-23 board switch

Switch No.	Name	Description	Factory setting
S1	1 Y MUTE	OFF (OPEN) : Normal mode ON (CLOSE) : Mute luminance signal	OFF (OPEN)
	2 C MUTE	OFF (OPEN) : Normal mode ON (CLOSE) : Mute color difference signal	OFF (OPEN)
3	_____	Factory use	OFF (OPEN)
4	_____	Factory use	OFF (OPEN)
5	COMB	Select whether to activate a comb filter when the color difference signal has significant line crawl which cannot be corrected by LCC or not. OFF (OPEN) : Comb filter OFF ON (CLOSE) : Comb filter ON	OFF (OPEN)
6	TBC TEST	Select whether to enable the TBC-23 and -24 boards self diagnostics or not. OFF (OPEN) : Normal mode ON (CLOSE) : Test (self diagnostics) mode	OFF (OPEN)
7	_____	Factory use	OFF (OPEN)
8	VIDEO PHASE	Select whether to use VIDEO PHASE VR or not. OFF (OPEN) : VIDEO PHASE VR (RV202) disabled ON (CLOSE) : VIDEO PHASE VR (RV202) enabled	OFF (OPEN)
S500	1 to 4	Factory use	OFF (OPEN)

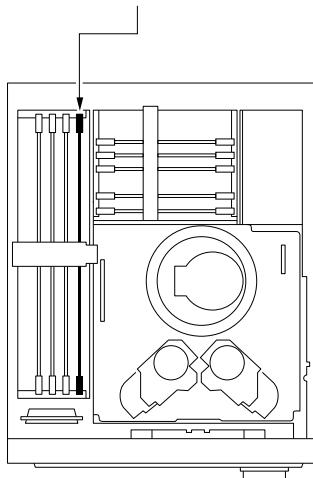
### 1-9-4. SS-63 Board

**Note**

Never change the settings of the factory use switches/short plugs.



SS-63 Board (A Side)



< Top View >

**Note**

Refer to “2-13. Pulling Out/Insertion of Plug-in Board” for pulling out and insertion of board.

#### SS-63 board short plug

Ref. No.	Name	Description	Factory setting
COR 100	_____	Factory use	OPEN
COR 101	_____	Factory use	OPEN
COR 102*1	_____	Factory use	OPEN
COR 103*1	_____	Factory use	SHORT *2
COR 104*1	_____	Factory use	SHORT *2

\*1 : Board number 1-661-127-13 only.

\*2 : COR103 and 104 have no plug, but they are shorted by patterns.

**SS-63 board switch**

Switch No.	Name	Description	Factory setting
S100	REEL POSITION	Press this switch when changing the reel position. This switch does not operate in the state of installing the cassette compartment.	_____
S101 1	FLASH MEMORY	<p><b>Note</b> Do not change the setting of this switch during installation. Select the operation mode of flash memory. OFF (OPEN): Normal mode ON (CLOSE): Writing mode</p>	OFF (OPEN)
2	ANA AUTO-TRACKING	Select whether to enable auto tracking operation or not during playing back the tape recorded based on the Betacam/Betacam SP format. OFF (OPEN): Not operate (The tracking is controlled using RV100.) ON (CLOSE): Operate <b>Note</b> The Betacam SX tape playback is carried out by non-tracking operation.	ON (CLOSE)
3	ANA DISABLE	Select whether to prohibit analog Betacam tape playback or not. OFF (OPEN): Enable ON (CLOSE): Disable	OFF (OPEN)
4	SV ERR DISABLE	<p><b>Note</b> Do not change the setting of this switch during installation. This switch selects whether to disable the detection of a malfunction error in a servo circuit. OFF (OPEN): Enable (normal) ON (CLOSE): Disable</p>	OFF (OPEN)
S700	SYSTEM RESET	Press this switch when resetting system control operation.	_____
S1100 1	EXTENDED MENU	OFF (OPEN): Not display extended menu of set up menu ON (CLOSE): Displays extended menu of set up menu	OFF (OPEN)
2	MAINT MODE ACCESS	OFF (OPEN): Not enter into maintenance mode from lower control panel ON (CLOSE): Enters into maintenance mode from lower control panel	OFF (OPEN)
3 to 8	_____	Factory use	OFF (OPEN)
S1101	MAINT MODE START	Press this switch when starting maintenance mode.	_____
S1102		<p><b>Note</b> Never change the settings of S1102 switch since each switch is set according to the characteristics of the unit. But set this switch according to each unit when replacing the board.</p>	
1 to 6	MODEL ID SWITCH		1: OFF (OPEN) 2: OFF (OPEN) 3: OFF (OPEN) 4: ON (CLOSE) 5: ON (CLOSE) 6: OFF (OPEN)
7	J/SY	OFF (OPEN): Japan model ON (CLOSE): Except Japan model	ON (CLOSE)
8	525/625	OFF (OPEN): 525/60 model ON (CLOSE): 625/50 model	DNW-A22: OFF (OPEN) DNW-A22P : ON (CLOSE)
S1900	1 to 8	Factory use	OFF (OPEN)

## 1-10. Mode Switching of Search Dial

There are two kinds of operation to switch the search dial of this unit to jog mode or shuttle mode.

### • SHUTTLE/JOG button selecting

When you press the SHUTTLE button, the digital videocassette player is switched to shuttle mode.

When you press the JOG button, the digital videocassette player is switched to jog mode.

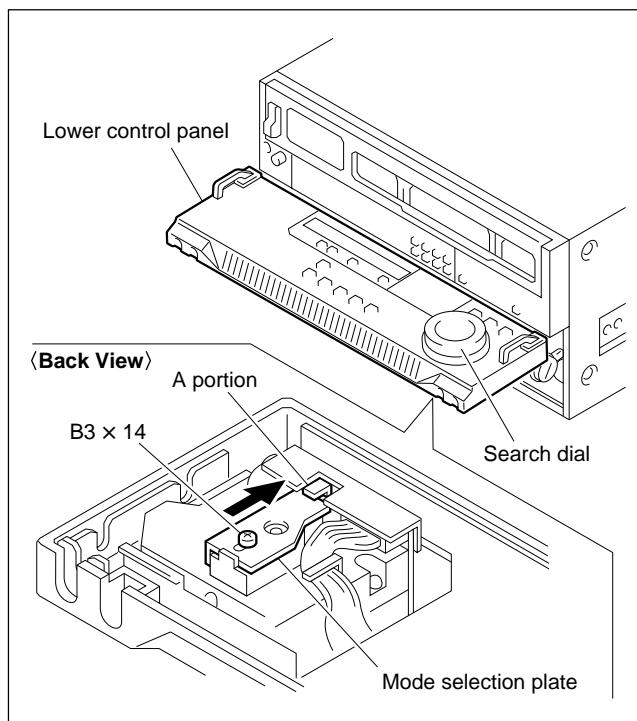
### • Search dial pressing

When you press the dial, the digital videocassette player toggles between shuttle and jog modes.

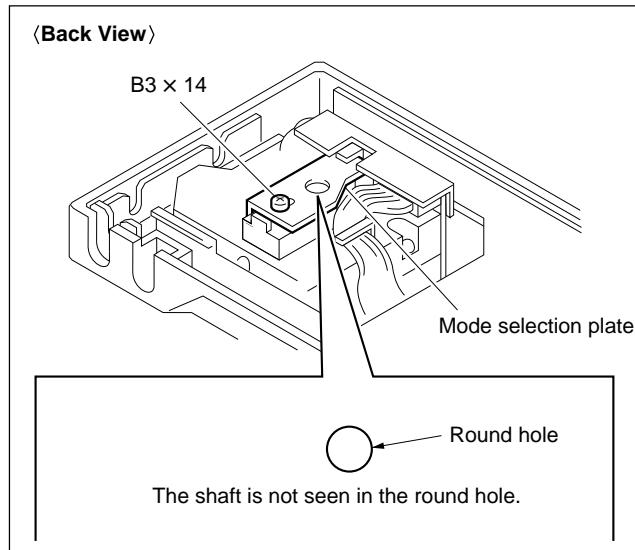
It is possible to prohibit a manner of toggling.

### Prohibiting Search Dial Pressing

- (1) Turn off the power.
- (2) Fix a lower control panel at 90°.
- (3) Loosen a screw on the backside of the search dial as shown in the figure.
- (4) Slide the mode selection plate in the direction indicated by the arrow until it touches the A portion.

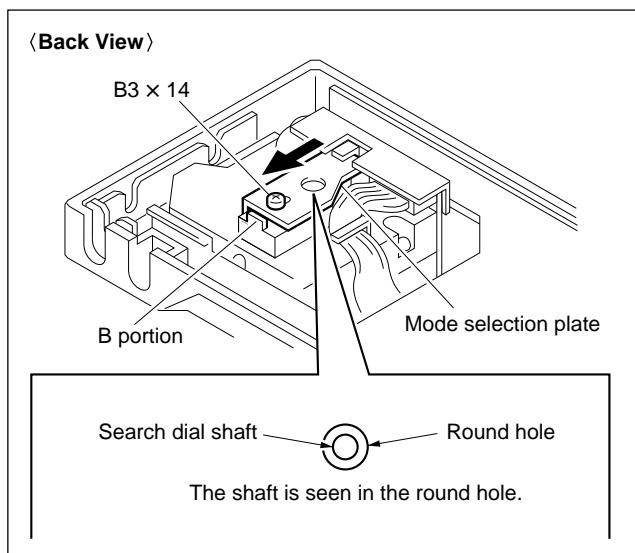


- (5) After checking that the shaft of the search dial is not seen in the round hole of the mode selection plate and then tighten the screw.



### Allowing Search Dial Pressing

- (1) Turning off the power.
- (2) Fix a lower control panel at 90°.
- (3) Loosen a screw on the backside of the search dial as shown in the figure.
- (4) Slide the mode selection plate in the direction indicated by the arrow until it touches the B portion.
- (5) After checking that the shaft of the search dial is seen in the round hole of the mode selection plate and then tighten the screw.



## 1-11. Setup Menu Items

The setup menu consists of a main menu and extended menu.

Refer to the operation manual for details of each menu.

**Note**

It is required to adjust the switch setting of SS-63 board when allowing the system menu to display. Refer to “1-10-5. SS-63 Board”.

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### Main Manu

#### ITEM-H00 series: Hours meter parameter

- H01: OPERATION HOURS
- H02: DRUM RUNNING HOURS
- H03: TAPE RUNNING HOURS
- H04: THREADING COUNTER
- H12: DRUM RUNNING HOURS (Resettable)
- H13: TAPE RUNNING HOURS (Resettable)
- H14: THREADING COUNTER (Resettable)
- H15: AIRFILTER OPERATION HOURS  
(Resettable)

#### ITEM-000 series: Operational parameter

- 002: CHARACTER H-POSITION
- 003: CHARACTER V-POSITION
- 005: DISPLAY INFORMATION SELECT
- 007: TAPE TIMER DISPLAY
- 009: CHARACTER TYPE
- 011: CHARACTER V-SIZE
- 013: 525/625 SYSTEM SELECT

#### ITEM-B00 series: Menu bank parameter

- B01: RECALL BANK 1
- B02: RECALL BANK 2
- B03: RECALL BANK 3
- B04: RECALL BANK 4
- B11: SAVE BANK 1
- B12: SAVE BANK 2
- B13: SAVE BANK 3
- B14: SAVE BANK 4
- B20: RESET SETUP

---

### Extended Menu

#### ITEM-100 series: Operational panel parameter

- 101: SELECTION FOR SEARCH DIAL ENABLE
- 102: MAXIMUM TAPE SPEED
- 104: AUDIO MUTING TIME

#### ITEM-300 series: Editing parameter

- 320: AUDIO PB PROCESS IN EDIT POINT

#### ITEM-500 series: Tape protection parameter

- 501: STILL TIMER

#### ITEM-700 series: Video control parameter

- 703: BLANK LINE SELECT
- 713: VIDEO SETUP REFERENCE LEVEL  
(525/60 system only)

#### ITEM-800 series: Audio control parameter

- 802: DIGITAL AUDIO MUTE IN SHUTTLE MODE
- 805: AUDIO MONITOR OUTPUT MIXING

#### ITEM-F00 series: Adjustment use only

- F01: AUTO NR IN SP MODE
- F02: EMERGENCY TAPE PROTECTION
- F13: TRACKING CONTROL VIA SEARCH DIAL
- F16: DEVICE TYPE MODIFY
- F34: STOP PINCH OFF TIME

## 1-12. Switching between 525/625 Line Systems

### In the NTSC Model

This unit can be switched from 525/60 system to 625/50 system. The tape recorded based on the Betacam SX format of 625/50 system can also be played back by switching the system.

#### Notes

The tape recorded based on the Betacam/Betacam SP format of 625/50 system cannot be played back in this unit.

### In the PAL Model

This unit can be switched from 625/50 system to 525/60 system. The tape recorded based on the Betacam SX format of 525/60 system can also be played back by switching the system. The signal of 525/60 system is output from all output connectors.

#### Notes

The tape recorded based on the Betacam/Betacam SP format of 525/60 system cannot be played back in this unit.

### Method of Switching

Set the ITEM-013 to ON and change the mode following message which is superimposed on the video monitor.



(It is necessary that the CHARACTER switch of the sub control panel is set to ON so that the message is superimposed on the video monitor.)

Refer to the operation manual “Section 7. Menu System” for details.

## Section 2

### Service Overview

#### 2-1. Notes on Power Supply Block

##### 2-1-1. Warning on Primary Circuit Block and Electric Shock

###### **WARNING**

The primary circuit consists of the AC-169 board with AC inlet, the circuit breaker, the POWER switch, and the power supply unit.

Be careful not to receive an electric shock when performing the maintenance and service works with the power turned on.

A primary voltage remains applied to the AC-169 board, circuit breaker, and POWER switch even if the POWER switch is turned off. For the work that requires no current conduction, therefore, turn off the POWER switch and disconnect the power cord.

##### 2-1-2. Note on Resetting the Circuit Breaker

The circuit breaker of a primary circuit is mounted on the power panel of this unit. When an overcurrent flows in the primary circuit, the breaker operates and the button protrudes.

If the breaker operates, eliminate the cause for which an overcurrent flows, then push the button.

#### 2-2. Cleaning when the Heads are Clogged

Clean using a cleaning cassette tape (specified product: BCT-5CLN) when the video heads are clogged.

For the cleaning, refer to “5-2-1. Cleaning by Cleaning Tape”.

###### **WARNING**

Clean the video heads in the prescribed procedure using a specified cleaning cassette tape. If not, the video heads may be abrasive or damaged.

If the head clogging is not solved using a cleaning cassette tape, use a cleaning cloth.

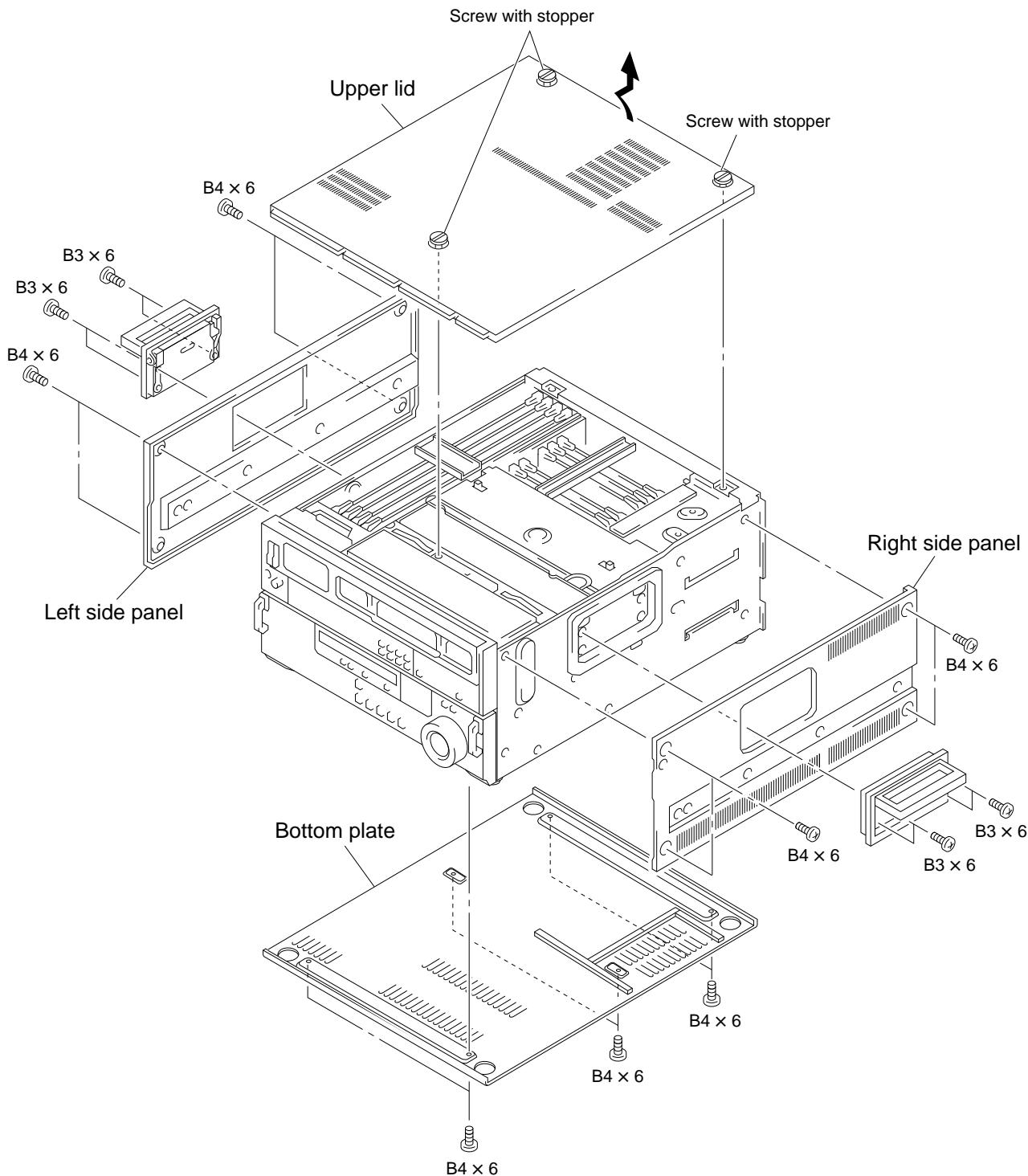
For the cleaning using a cleaning cloth, clean according to the procedure of “5-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning” after confirming the cautions and preparation in “5-2-2. General Information for Cleaning by Cleaning Cloth”.

## 2-3. Removal/Installation of Cabinet

### 2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation

#### Notes

- Turn off the power and unplug the power cord before starting the removal/installation.
- Use the designated screws or this unit may be damaged.



### Upper Lid

- (1) Loosen three fixing screws.
- (2) Remove the upper lid by moving in the direction indicated by the arrow.

For installation, perform in the reverse procedures of removal.

### Side Panels

(The right and left side panels are the same in procedure.)

- (1) Remove four screws (B3 × 6), and remove the handle.
- (2) Remove four screws (B4 × 6), and remove the side panel.

For installation, perform in the reverse procedures of removal.

### Bottom Plate

#### Note

- With the handle attached, place the unit on its right side panel down for removal and installation. Lend your hand so that the lower handle does not hang down.

- (1) Remove six screws (B4 × 6), and remove the bottom plate.

For installation, perform in the reverse procedures of removal.

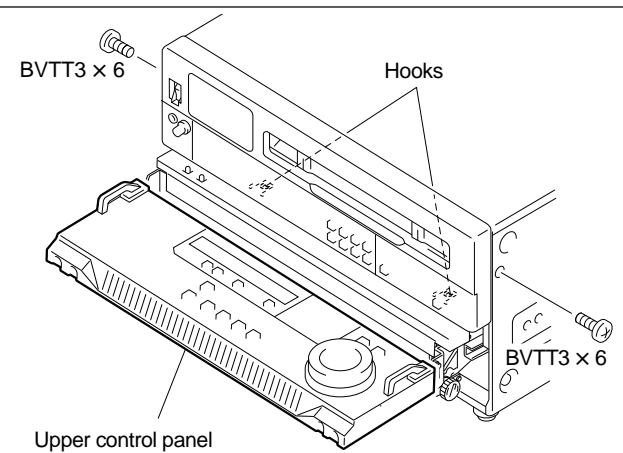
## 2-3-2. Control Panels Removal/Installation

#### Note

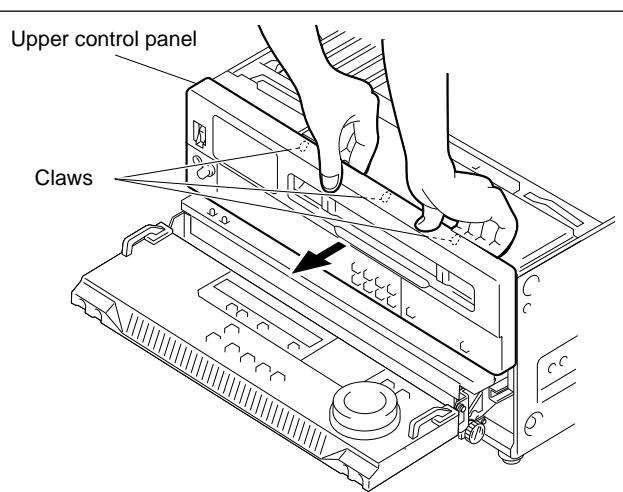
Turn off the power and unplug the power cord before starting the removal/installation.

### Upper Control Panel

- (1) Remove the upper lid.  
(Refer to “2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation”.)
- (2) Remove the each one screw on the left and right sides.
- (3) Take both side handles on a lower control panel and pull them slightly forward, then pull them more strongly. Then the lower control panel tilts upward (to 90° position).
- (4) Unhook two hooks at lower portion on the upper control panel.



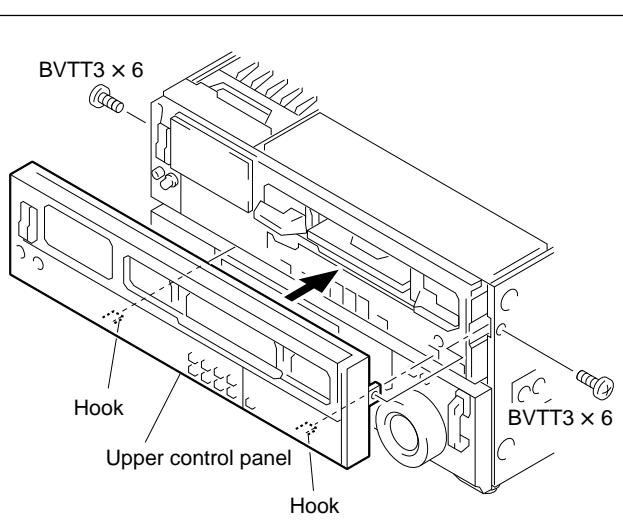
5. Unhook the claws at the upper control panel from the chassis, and remove it in the direction of the arrow.



For installation, perform in the reverse procedures of removal.

#### Note

Insert the hooks at the back of the panel into the convex portions of the chassis, then install the panel in the chassis. (Refer to the figure below.)



**Note**

Turn off the power and unplug the power cord before starting the removal/installation.

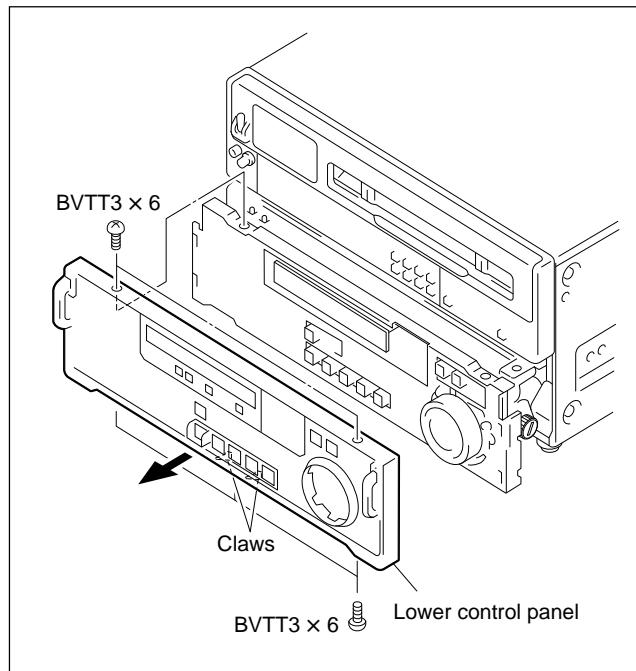
**Lower Control Panel**

- (1) Take both side handles of a lower control panel and pull them slightly forward, then pull them more strongly.
- (2) Remove five screws on the top and bottom of the lower control panel, then remove the panel.

**Note**

Open the lower control panel in this case. The screws at the bottom can be removed easily.

- (3) Remove two claws at the back of the lower control panel.
- (4) Remove the lower control panel in the direction of the arrow.

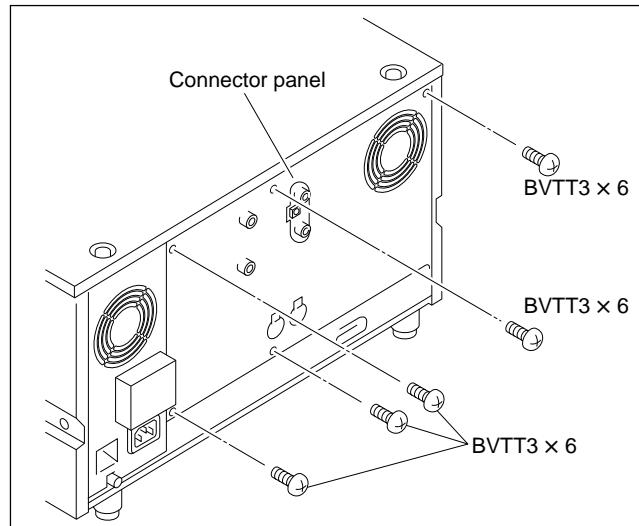


For installation, perform in the reverse procedures of removal.

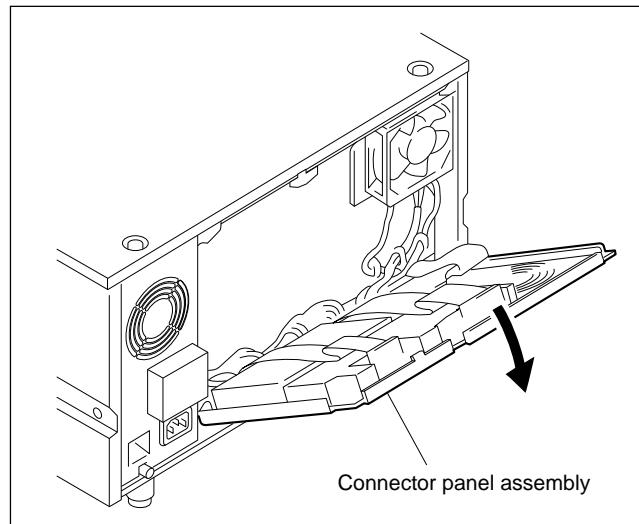
**2-3-3. Connector Panel Assembly Removal/Installation****CAUTION**

For your safety, turn off the power and unplug the power cord before starting the removal/installation.

- (1) Remove six screws indicated ⇒ on the connector panel.



- (2) Remove the connector panel assembly so as not to stretch the harness as shown in the figure.



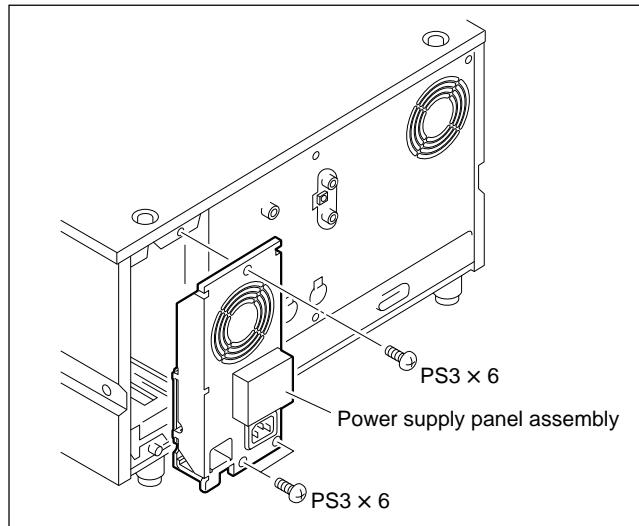
For installation, perform in the reverse procedures of removal.

### 2-3-4. Power Supply Panel Assembly Removal/Installation

#### CAUTION

For your safety, turn off the power and unplug the power cord before starting the removal/installation.

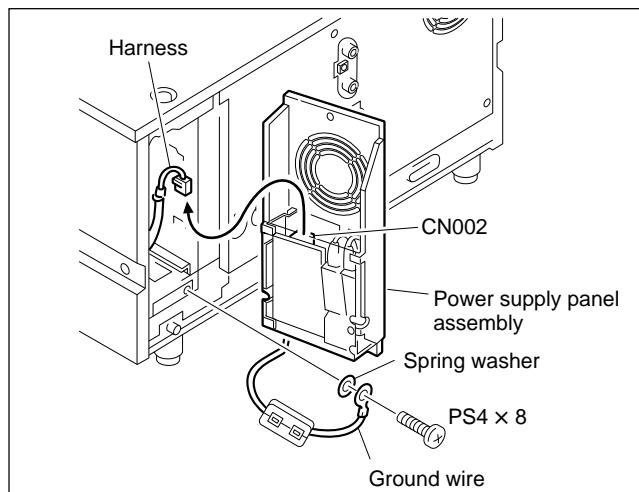
- (1) Remove three screws, then pull out the power supply panel assembly.



- (2) Disconnect the harness from the connector (CN002) on AC-169 board.
- (3) Remove one screw fixing the ground wire to the chassis and remove the power supply panel assembly.

#### Note

Be sure to remove the spring washer.



For installation, perform in the reverse procedures of removal.

#### Note

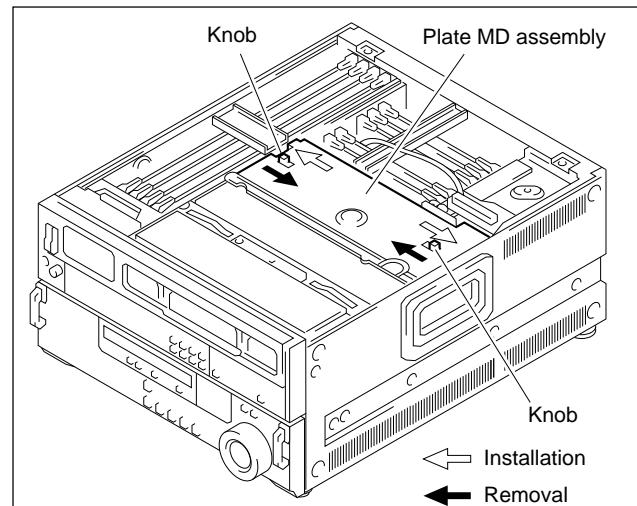
To fix the ground wire, put the spring washer between the terminal of ground wire and chassis.

### 2-4. Plate MD Assembly Removal/Installation

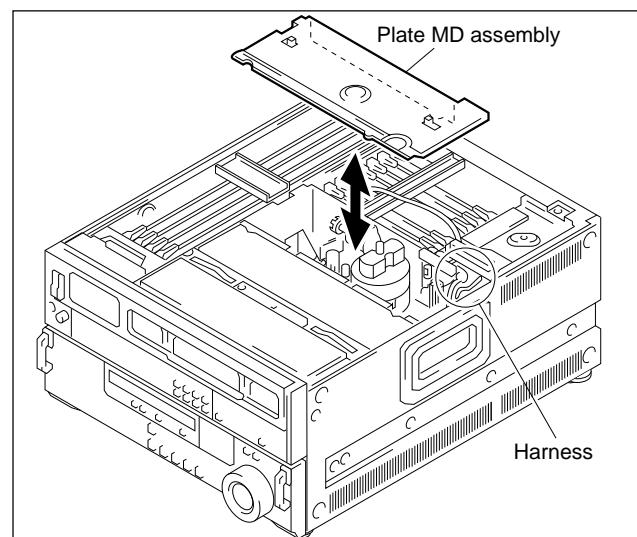
#### Note

Turn off the power and unplug the power cord before starting the removal/installation.

- (1) Remove the upper lid.  
(Refer to “2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation”.)
- (2) Slide the knobs on the plate MD assembly each in the inside.  
(Move the knobs to the outside. The plate MD assembly is then fixed.)



- (3) Remove the plate MD assembly.



For installation, perform in the reverse procedures of removal.

#### Note

Be careful not to pinch the harness under the plate MD assembly in the installation.

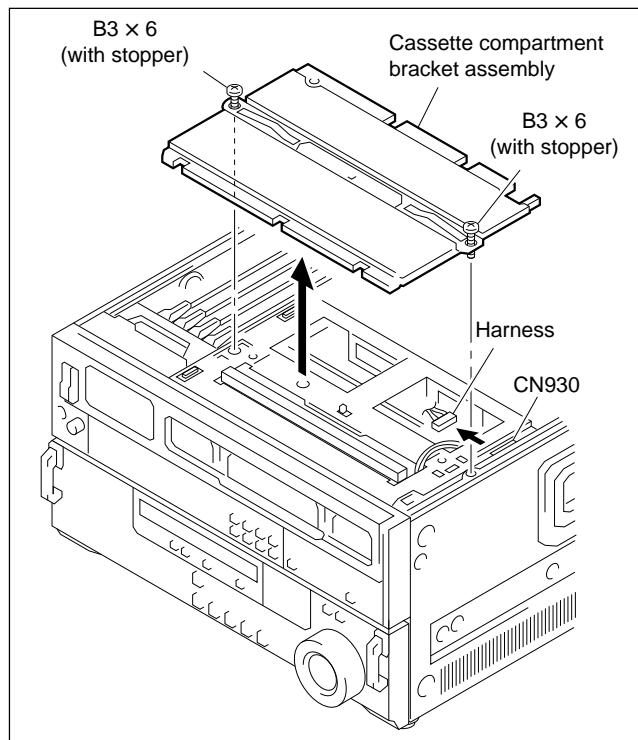
## 2-5. Cassette Compartment Removal/Installation

### Notes

- Turn off the power and unplug the power cord before starting the removal/installation.
- The cassette compartment cannot be removed with the cassette tape inserted. Press the EJECT button with the power turned on and eject the cassette tape.  
If the cassette compartment does not move due to an electric trouble, take out the cassette tape manually.  
(Refer to “2-12. How to Take Out the Cassette when the Tape is Slacking”.)

### Removal

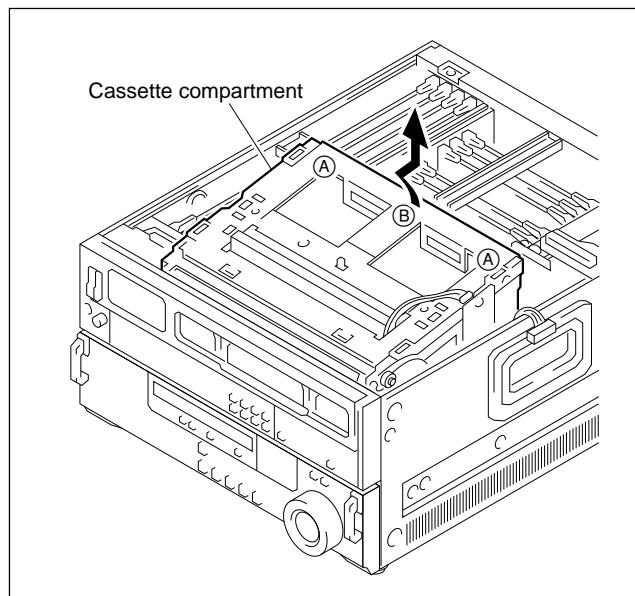
- (1) Remove the upper lid.  
(Refer to “2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation”).)
- (2) Remove the plate MD assembly.  
(Refer to “2-4. Plate MD Assembly Removal/Installation”.)
- (3) Loosen two screws, then remove the cassette compartment bracket assembly.
- (4) Disconnect the harness from the connector (CN930) on CL-29 board, and set the harness so that it does not put between chassis.



5. Hold the cassette compartment at the portions (A) and lift up the cassette compartment slightly (by 1 cm). When the four cassette compartment positioning legs come off from the four positioning holes on a mechanical deck, shift the cassette compartment backward (by 1 cm) to the position where the cassette door can be completely seen when viewed from just above.
6. Hold the cassette compartment at the portion (B) and raise it slowly upward, then remove it.

### Notes

- Raise it slowly while sliding the cassette compartment slightly back-and-forth so that the gear on the right side of the cassette compartment does not touch the chassis.
- Never move the cassette compartment to right and left. If unnecessary force is applied to right and left, the gear or parts may come off.
- Place the cassette compartment with the cassette door up or with cassette compartment positioning legs down.  
(If it is placed on the cassette lid down, the flexible card wire/board might be damaged.)



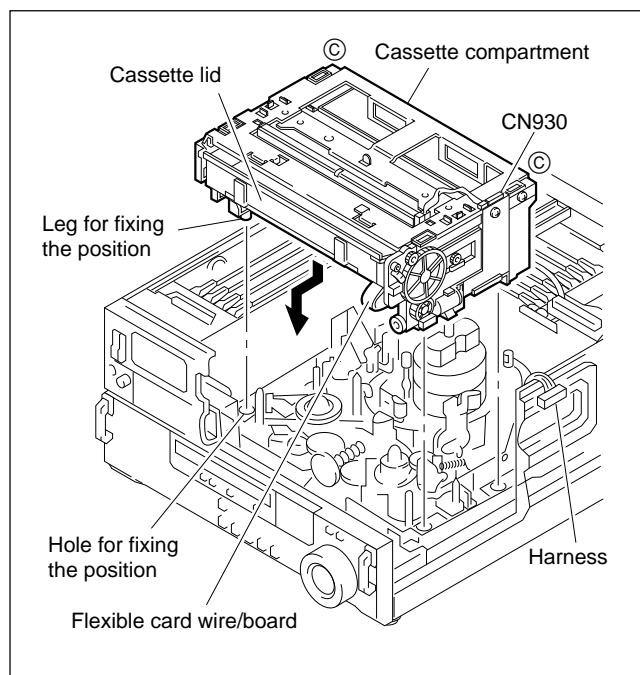
## Installation

- (7) Install the cassette compartment while inserting slantingly in the direction as shown in the figure.

### Notes

- Insert it slowly while sliding the cassette compartment slightly back-and-forth so that the gear on the right of the cassette compartment does not touch the chassis.
- Never move the cassette compartment to right and left. If unnecessary force is applied to right and left, the gear or parts may come off.

- (8) Insert the four legs of the cassette compartment for fixing the position into the four holes on the mechanical deck for fixing the position by pressing the ④ portions as shown in the figure.



- (9) Connect the harness to the connector (CN930) on the CL-29 board.

- (10) Install the cassette compartment bracket assembly.

- (11) Install the plate MD assembly and the upper lid.

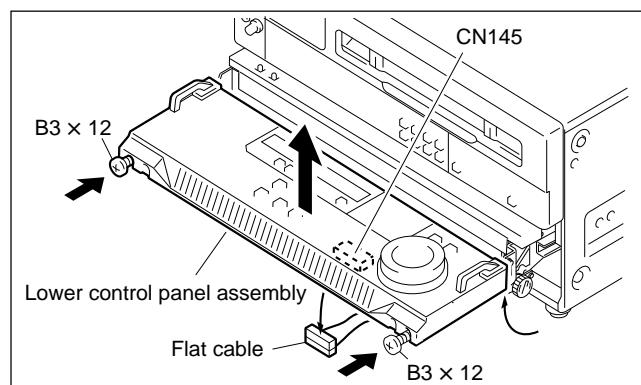
## 2-6. Lower Control Panel Assembly Removal/Installation

### Note

Turn off the power and unplug the power cord before starting the removal/installation.

### Removal

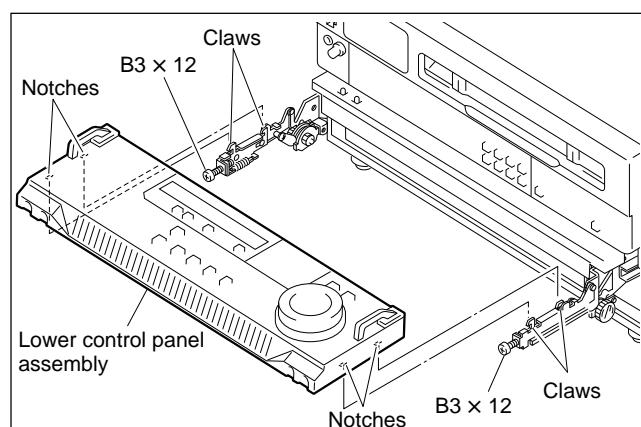
- (1) Take both side handles on a lower control panel and pull them slightly forward, then pull them more strongly. Then the lower control panel tilts upward (to 90° position).
- (2) Disconnect the flat cable from the connector (CN145) on the back of the lower control panel.
- (3) Loosen two screws in bottom corners of the lower control panel assembly. (Loosen the screws until screw's top are exposed from the lack of the panel assembly.)
- (4) Push the loosened screws in the direction indicated by the arrow, and raise the lower control panel assembly.



### Installation

- (5) Set the notches of the panel assembly to the claws of the arms and insert the panel assembly until making a click sound.

- (6) Fix the lower control panel assembly with two screws.



- (7) Connect the flat cable to the connector (CN145).

- (8) Return the lower control panel to 0°, then store.

## 2-7. Circuit Function

System configuration	No.	Board name	Circuit function
Digital process	1	DPR-71D	Digital data processor (Outer error correction)
	2	DPR-73F	Digital data processor (Audio/Video processor)
Video process	3	VPR-17F/17FP	Video signal processor (A-D, D-A, Reference clock generator, Composite encoder)
Analog BETACAM video PB process	4	DM-89/89P	RF demodulator for Analog Betacam PB
	5	TBC-24/24P	TBC (A-D, Write clock generator)
	6	TBC-23/23PG	TBC (Sequence and Reference)
Audio process	7	APR-12F/12FP	Audio D-A (Monitor), Analog Betacam audio (LAU) PB circuit
RF process	8	EQ-56F	RF equalizer (PB EQ, Analog BETACAM PB buffer, Inner error correction)
System/servo control	9	SS-63	System control, Servo control
	10	MS-50	Solenoids driver (Pinch, Brakes, Cleaning), Sensors input, Degaussing head driver
	11	DR-315	Motors driver (Drum, Capstan, Reels, Threading, Reel shift, Cassette up/down)
	12	TC-96D	TC PB circuit
Mech. deck driver/sensor	13	SE-341	Connection board with Condensation sensor
	14	PTC-54	Threading FG
	15	CCM-15	Threading motor
	16	CCM-15	Reel shift motor
	17	PD-35	Pinch solenoid connection, Tape end sensor connection
	18	TR-79	T tension sensor, Threading-end and Unthreading-end sensors
	19	PTC-59	Cassette's holes sensor
	20	RM-82	T reel motor
	21	SE-344	T reel FG
	22	RM-82	S reel motor
	23	SE-344	S reel FG
	24	PTC-71	Reel position sensors
	25	TR-78	S tension sensor
Cassette compartment	26	CL-29	Cassette up/down motor, Cassette down sensors
	27	LP-81	Lamp of cassette compartment
	28	PC-70	Cassette-in sensors, Cassette size sensor
Front panel	29	FP-91	Panel function (Switches, LEDs) control, CAV control level conversion
	30	VR-223D	Phone level VRs, Phone connector
	31	VR-207	Audio PB level
	32	SWC-30F	Upper control panel function (Switches, LEDs)
	33	SWC-31F	Sub control panel function
	34	KY-364F	Lower control panel function
	35	PTC-69	Search dial sensor, Dial solenoid connection

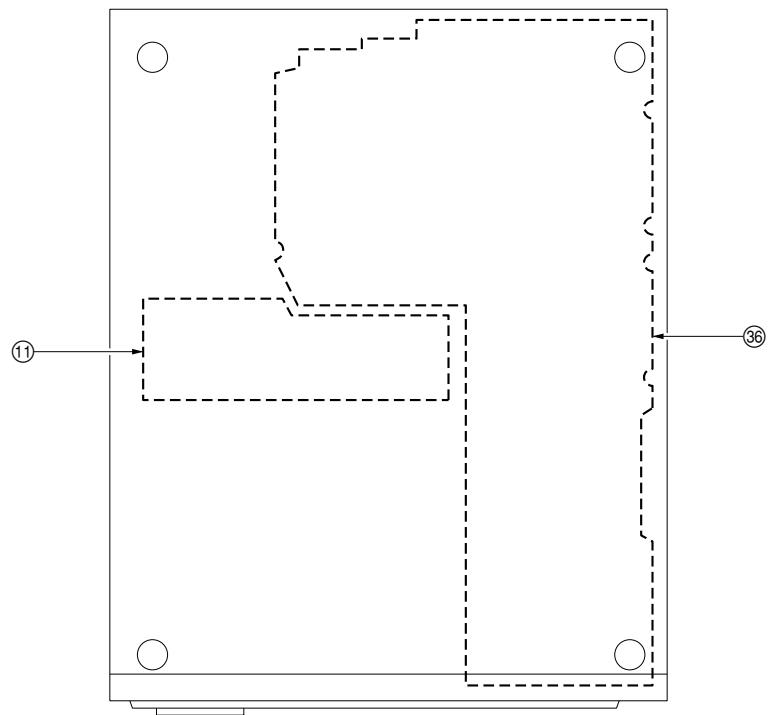
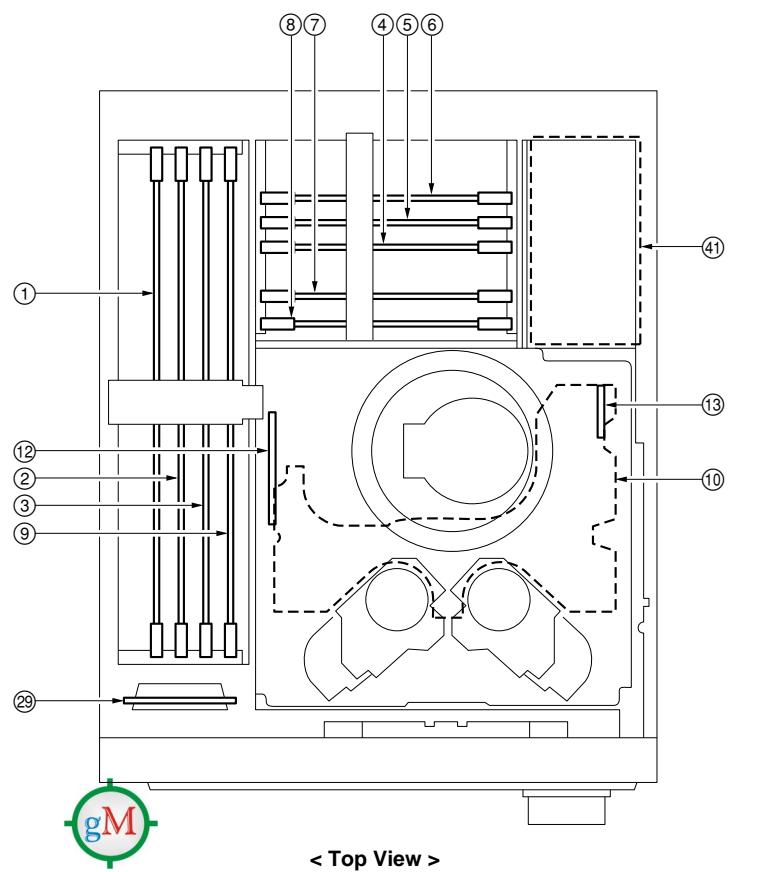
<b>System configuration</b>	<b>No.</b>	<b>Board name</b>	<b>Circuit function</b>
Motherboard, connector panel	36	MB-648F	Motherboard, Remote control connectors (REMOTE, RS-232C, VIDEO CONTROL)
	37	CP-279N	Connector board (Analog video) with output buffer
	38	CP-280N	Connector board (MONITOR output)
	39	CP-287N	Connector board (RF adaptor) with P-S
Power	40	AC-169	AC connector board with Breaker
	41	PS unit	Switching regulator (PS=Power supply)

## 2-8. Location of Main Parts

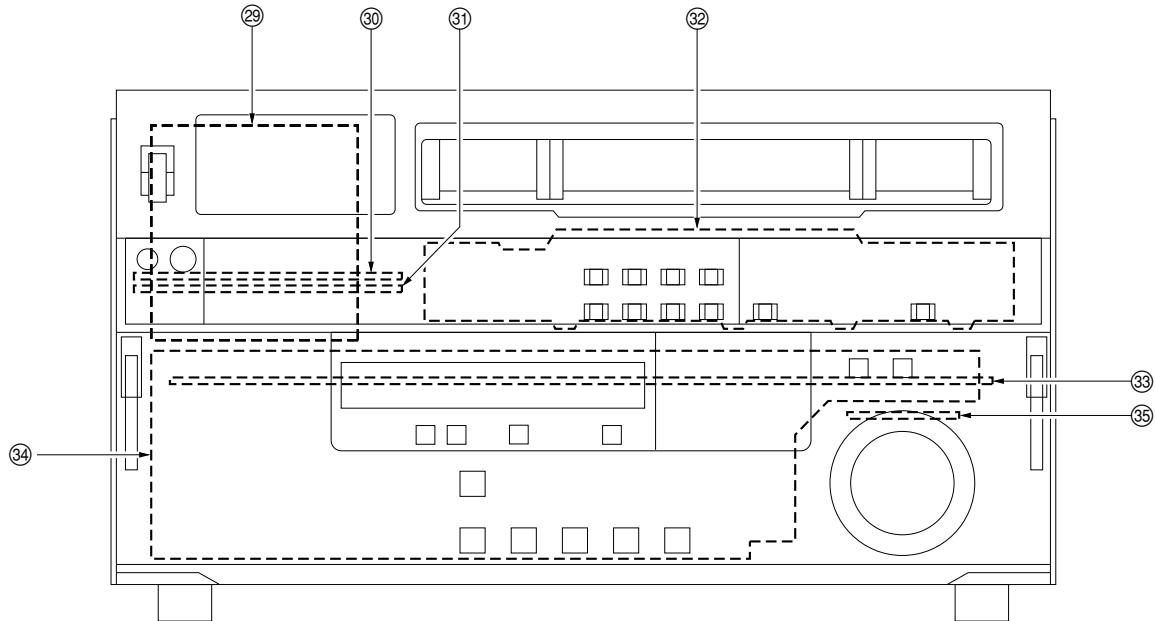
### 2-8-1. Printed Circuit Boards and Power Supply Unit Location

AC-169 .....	④〇
APR-12 .....	⑦
CCM-15 .....	⑯〇
CL-29 .....	㉖
CP-279 .....	㉗
CP-280 .....	㉘
CP-282 .....	㉙
DM-89 .....	④
DPR-71 .....	①
DPR-73 .....	②
DR-315 .....	㉑
EQ-56 .....	⑧
FP-91 .....	㉙
KY-364 .....	㉔
LP-81 .....	㉗
MB-648 .....	㉖
MS-50 .....	⑩
PC-70 .....	㉘
PD-35 .....	㉗
PTC-54 .....	㉔
PTC-59 .....	㉙
PTC-69 .....	㉕
PTC-71 .....	㉔
RM-82 .....	㉚㉙
SE-341 .....	㉑
SE-344 .....	㉛㉙
SS-63 .....	⑨
SWC-30 .....	㉒
SWC-31 .....	㉓
TBC-23 .....	⑥
TBC-24 .....	⑤
TC-96 .....	㉒
TR-78 .....	㉕
TR-79 .....	㉘
VPR-17 .....	③
VR-207 .....	㉛
VR-223 .....	㉙

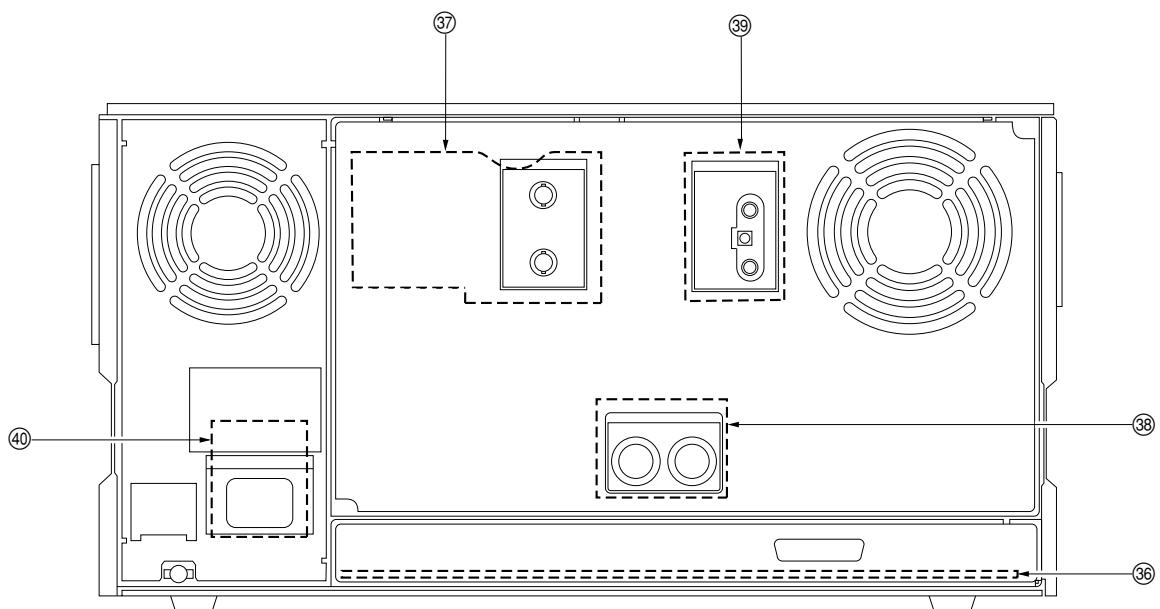
Power supply unit .... ④〇



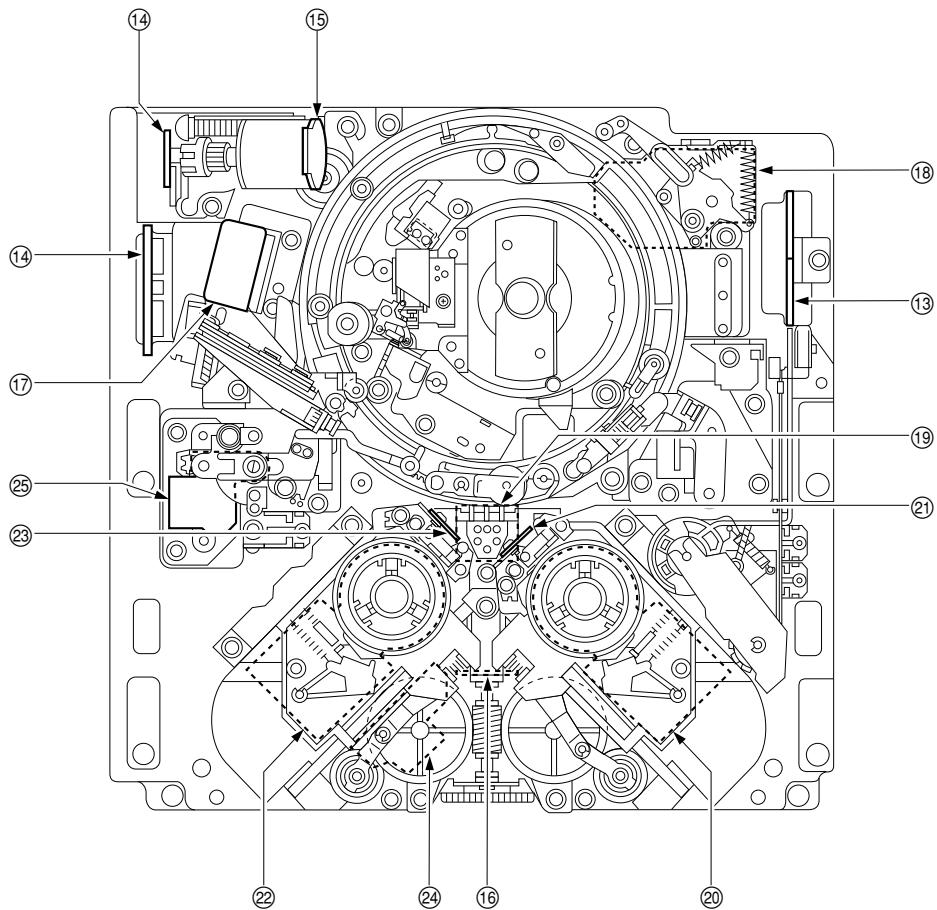
< Bottom View >



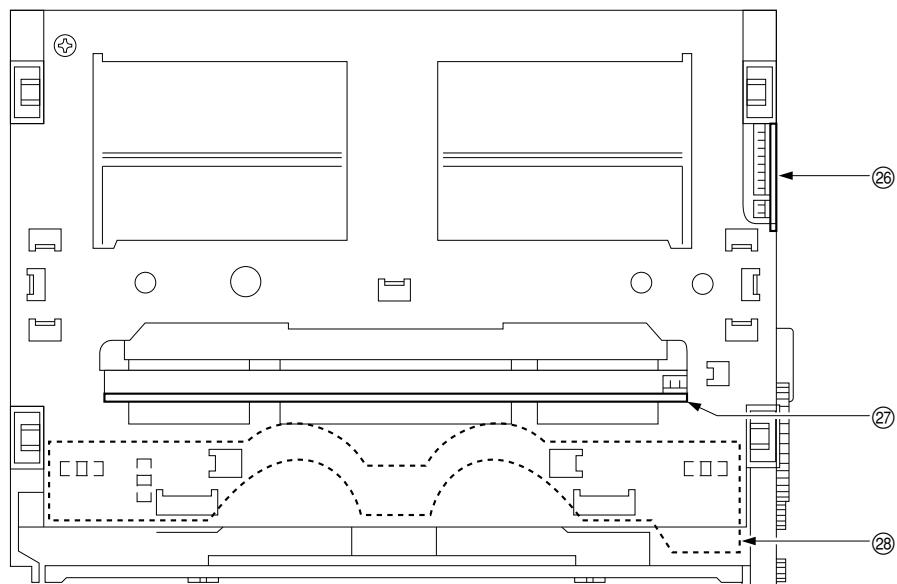
&lt; Front View &gt;



&lt; Rear View &gt;

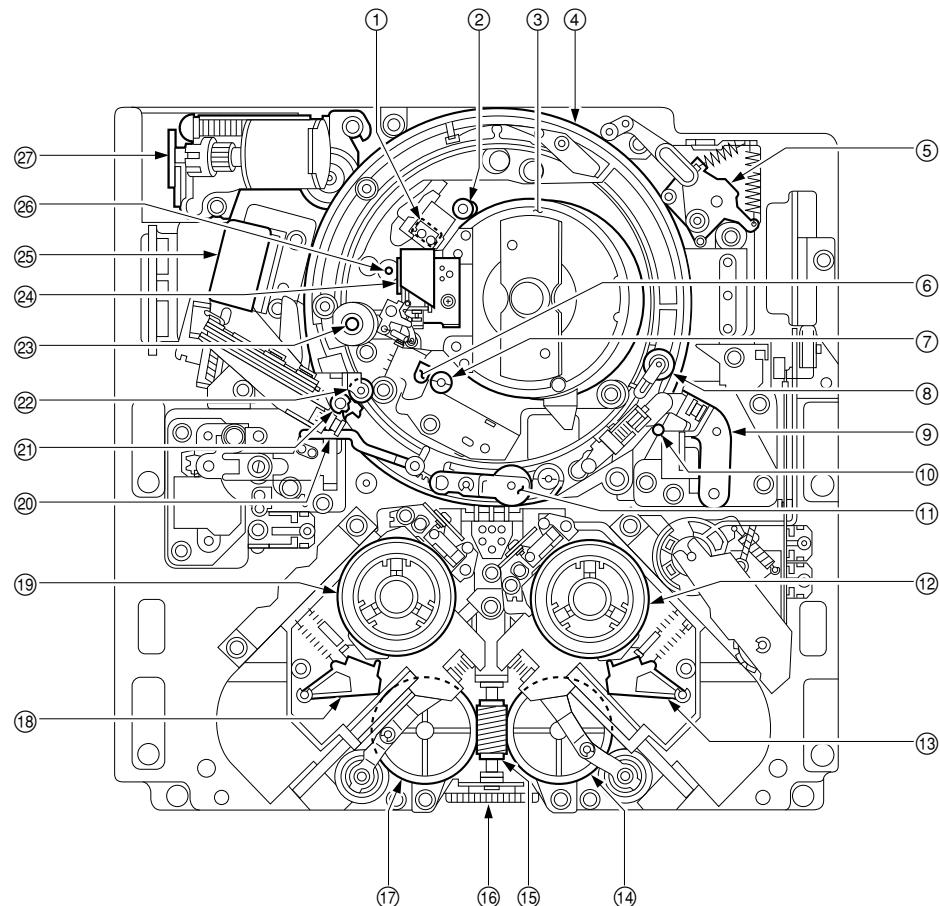


< Top View of Mechanical Deck >



< Top View of Cassette Compartment >

## 2-8-2. Main Mechanical Parts Location

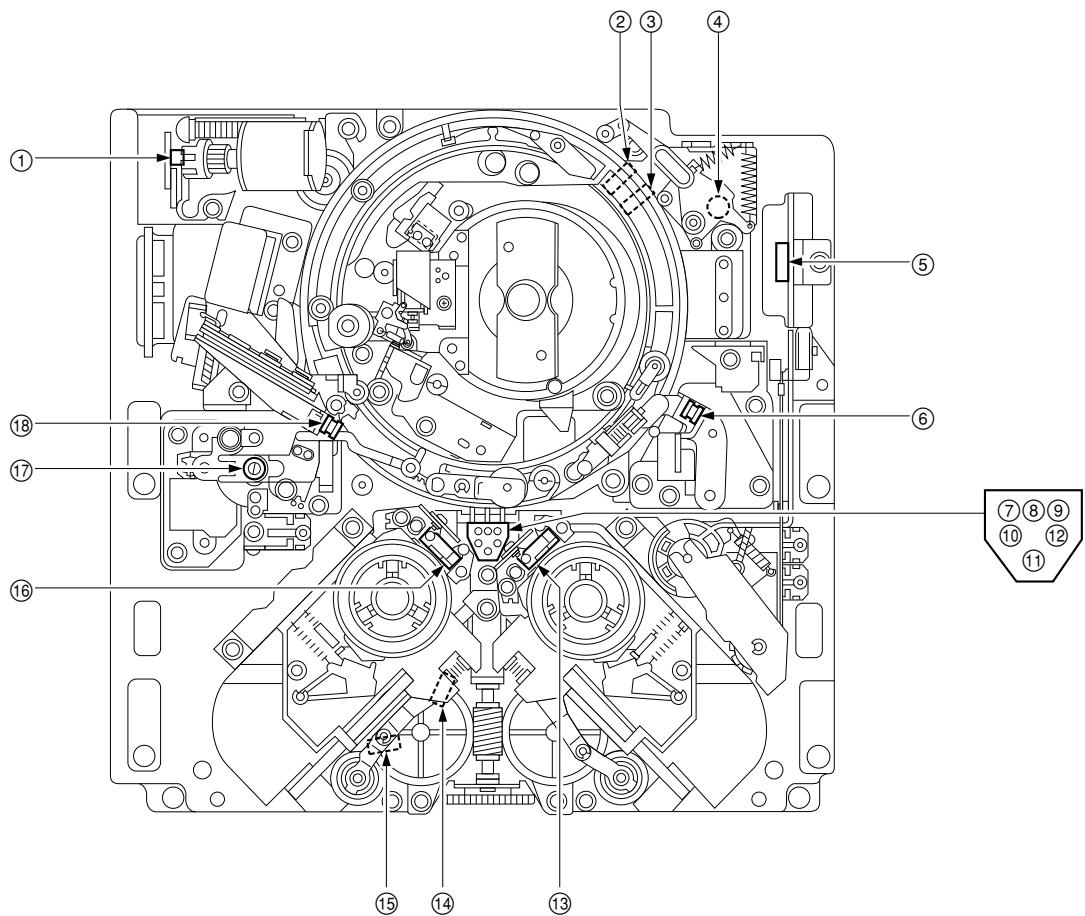


< Top View of Mechanical Deck >

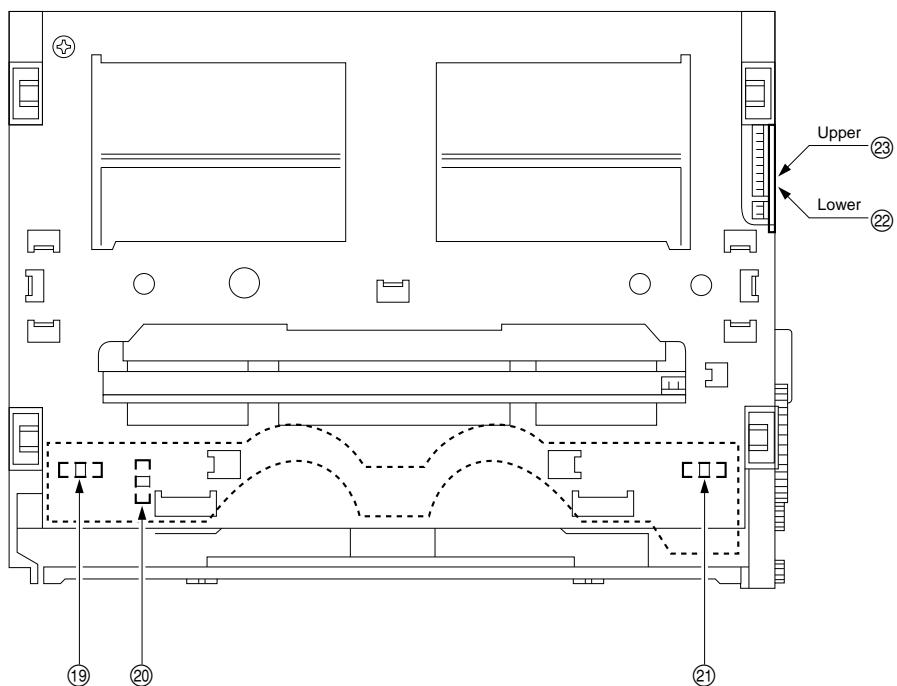
### INDEX

- |                             |                              |
|-----------------------------|------------------------------|
| (1) Audio/TC head           | (14) T worm wheel            |
| (2) TG-3 tape guide         | (15) Worm gear               |
| (3) Head drum               | (16) Drive gear              |
| (4) Threading ring          | (17) S worm wheel            |
| (5) T tension regulator arm | (18) S brake assembly        |
| (6) CTL head                | (19) S reel table            |
| (7) TG-2 tape guide         | (20) S tension regulator arm |
| (8) Audio/TC head cleaner   | (21) Tape cleaner            |
| (9) T drawer arm            | (22) TG-0 tape guide         |
| (10) TG-10 tape guide       | (23) Capstan shaft           |
| (11) Pinch roller           | (24) Cleaning roller block   |
| (12) T reel table           | (25) Pinch press block       |
| (13) T brake assembly       | (26) TG-4 tape guide         |
|                             | (27) Threading gear block    |

## 2-9. Function and Location of Sensors



< Top View of Mechanical Deck >



< Top View of Cassette Compartment >

**① Threading motor FG sensor**

This sensor detects the rotation speed of the threading motor.

The output signal of this sensor enters the threading/unthreading motor servo circuit, and controls the threading/unthreading speed to protect the tape damage during threading/unthreading operation.

**② Unthreading-end sensor****③ Threading-end sensor**

These sensors detect whether the threading ring reaches the threading-end or unthreading-end position.

**④ T tension regulator arm sensor**

This sensor detects the position of a T tension regulator arm.

During playback, the output signal of this sensor enters the T reel motor servo circuit, and controls the reel torque to keep a constant T tape tension.

**⑤ Condensation sensor**

This sensor detects whether the dew condensation occurs in the unit.

**⑥ Tape top sensor**

This sensor detects the beginning of the tape, and in addition detects the end of the tape that runs in the reverse direction.

**⑦ Reel hub diameter sensor**

This sensor detects the reel hub diameter detection tab of a cassette.

The reel hub with two types of diameters (thin and thick) is available according to the length of a tape stored in a cassette.

This sensor is used to discriminate the diameter. The output signal of this sensor enters the servo circuit of take-up and supply reel motors, and controls the reel rotation speed and torque during tape transport.

**⑧ Metal/oxide tape sensor**

This sensor detects the metal tape detection tab of a Betacam/Betacam SP cassette.

This sensor is used to discriminate whether the tape stored in a Betacam/Betacam SP cassette is an oxide tape or metal particle tape.

**⑨ Tape thickness sensor**

This sensor detects the tape thickness detection tab of a cassette.

This sensor is used to discriminate the thickness of the tape stored in a cassette.

**⑩⑪⑫ Cassette classification sensors**

These sensors detect the three cassette type detection tabs of a cassette.

These sensors are used to discriminate whether a cassette can be used in this unit.

**⑬ T reel table FG sensor**

This sensor detects the rotation speed of the take-up reel motor.

The output signal of this sensor enters the reel motor servo circuit, and controls the reel table rotation speed.

**⑭ Reel S position sensor****⑮ Reel L position sensor**

These sensors detect whether the reel table moves to the correct position according to the size of the inserted cassette.

**⑯ S reel table FG sensor**

This sensor detects the rotation speed of the supply reel motor.

The output signal of this sensor enters the reel motor servo circuit, and controls the reel table rotation speed.

**⑰ S tension regulator arm sensor**

This sensor detects the position of an S tension regulator arm.

During playback, the output signal of this sensor enters the S reel motor servo circuit, and controls the reel torque to keep a constant S tape tension.

**⑱ Tape end sensor**

This sensor detects the end of the tape that runs in the forward direction.

**⑲ Cassette -in sensor (L)**

This sensor detects whether a cassette is being inserted.

**⑳ Cassette size sensor**

This sensor detects whether the inserted cassette is L size or S size.

**㉑ Cassette-in sensor (R)**

This sensor detects whether a cassette is being inserted.

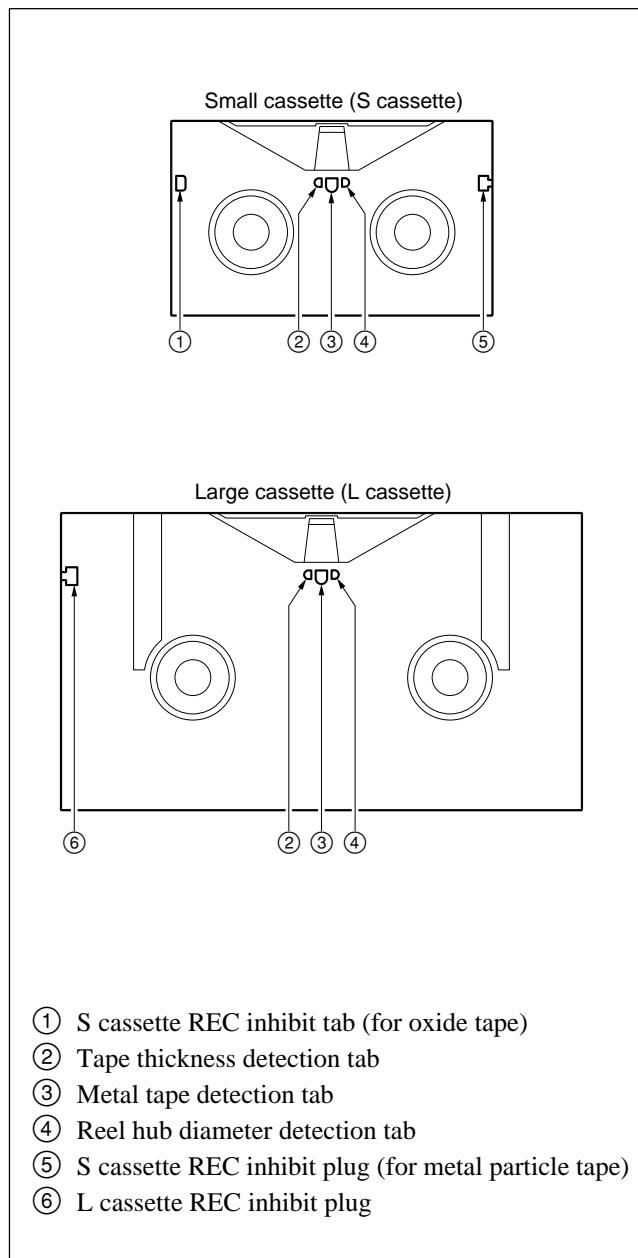
**㉒ Cassette-down (2) sensor****㉓ Cassette-down (1) sensor**

These sensors detect the movement (position) of a cassette compartment by the combination of the detection state of the two sensors and a cassette-in sensor.

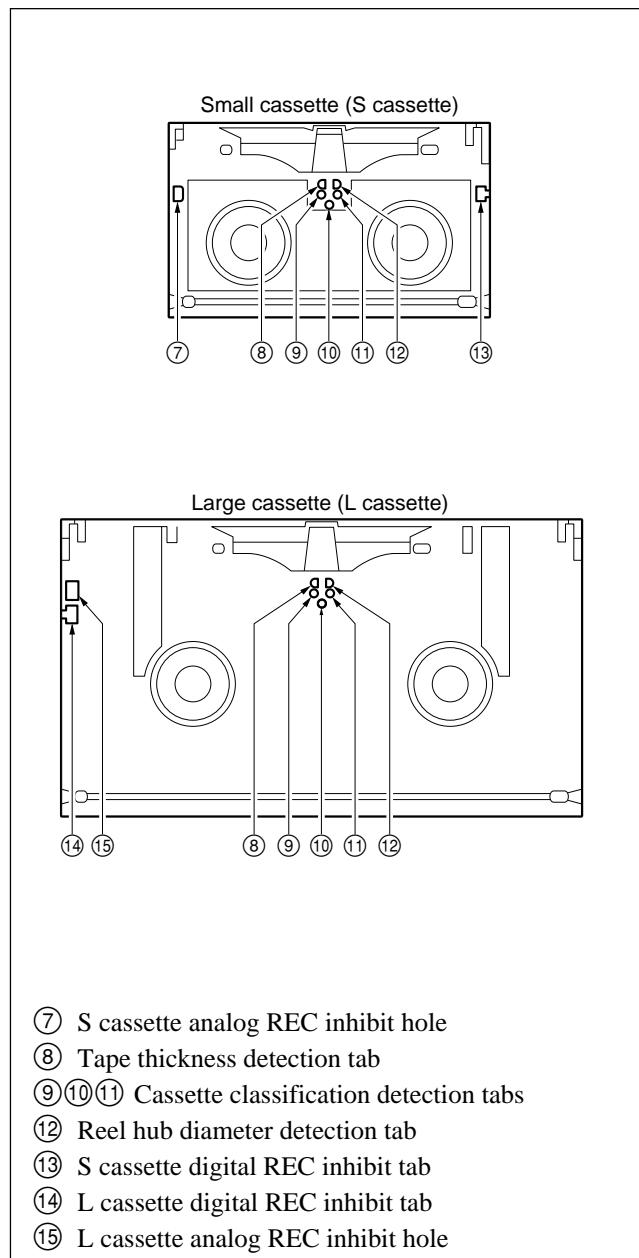
## 2-10. System of Cassette

As shown in the figure below, plugs and tabs are provided at the back side of the cassette tape.

**Cassette for Betacam or Betacam SP**



**Cassette for Betacam SX**



## Detection Tabs

### In cassette for Betacam or Betacam SP

No.	Use	With tab (Close hole)	Without tab (Open hole)
②	Tape thickness detection	Thick (Tape thickness is 20 µm)	Thin (Tape thickness is 15 µm)
③	Metal tape detection	Oxide tape	* Metal particle tape
④	Reel hub diameter detection	Small hub	Large hub

\* : For the metal particle tape, digital recording can be performed using a Betacam SX format.

### In cassette for Betacam SX

No.	Use	With tab (Close hole)	Without tab (Open hole)
⑧	Tape thickness detection	Tape thickness is 14.5 µm	Tape thickness is except 14.5 µm
⑫	Reel hub diameter detection	Small hub	Large hub
⑨⑩⑪	Cassette classification detection	Without tab (open hole) at only ⑨ for Betacam SX cassette. Represents the cassette classification by combination of three tabs. (See below)	

### Cassette classification detection tabs

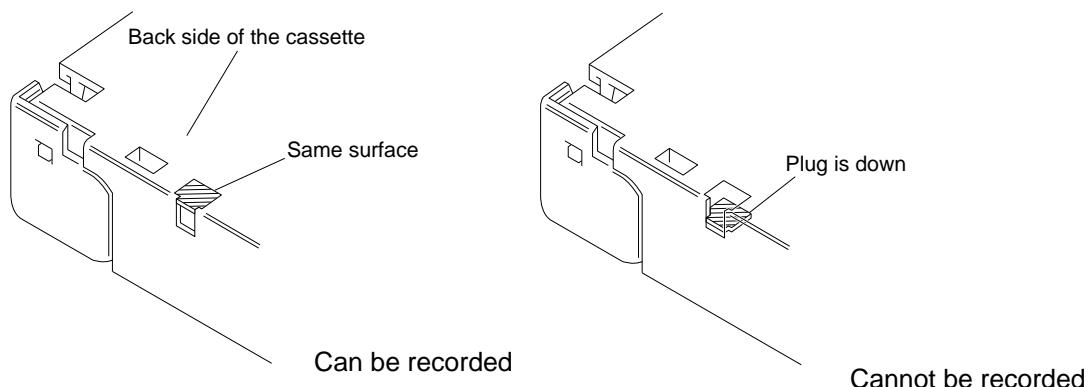
○ : with tab (close hole), ● : without tab (open hole)

State of tabs ⑨⑪ ⑩	Cassette class	Remake
○○	Betacam or Betacam SP	—
○●	Betacam SX	—
●○	Digital Betacam	Unusable
●○, ○○, ○●, ○●, ●●	Except the above class	Unusable

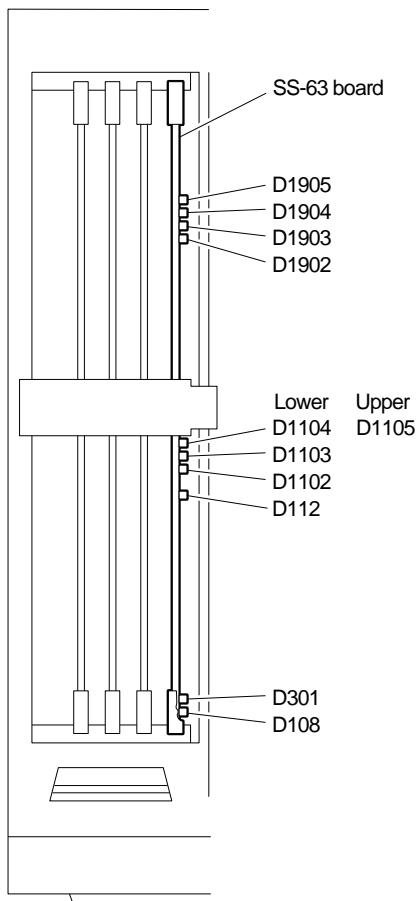
#### Note

##### REC inhibit plugs

(The REC inhibit plug is not detected since this unit is player.)



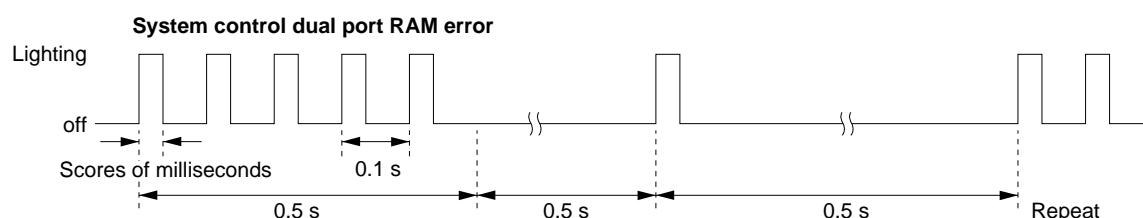
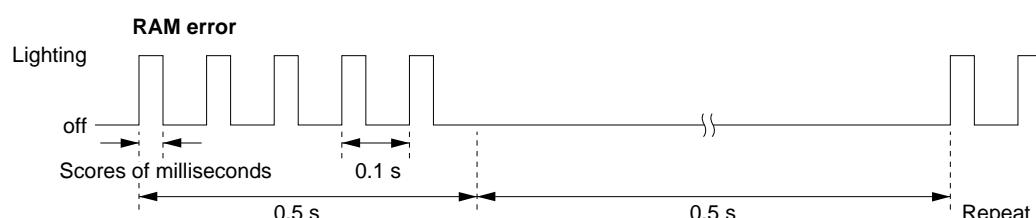
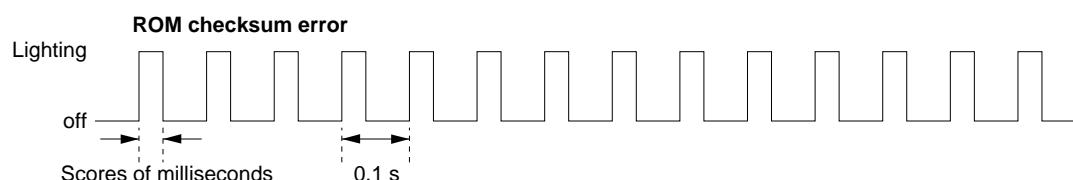
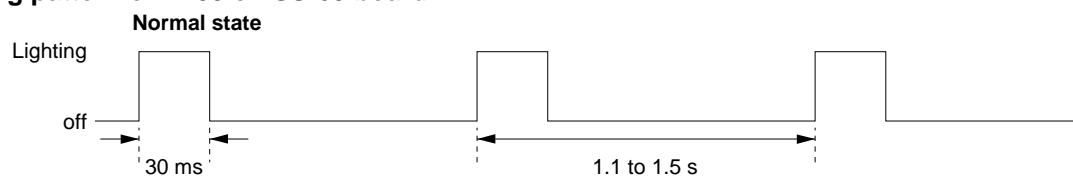
## 2-11. Information of LEDs on Circuit Boards

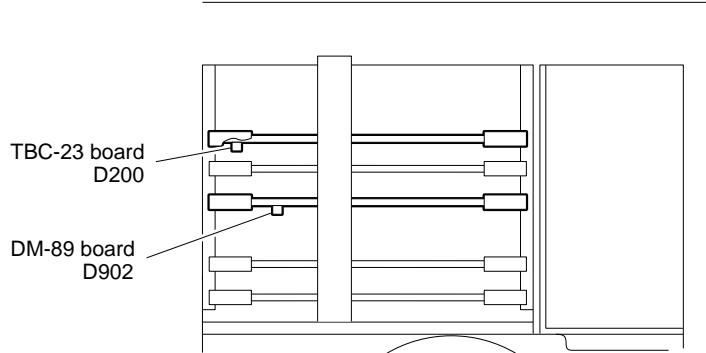


## SS-63 board

LED No.	Name	Color	Description	Normal state
D108	SV	Amber	Represents the result of communication check to ROM and RAM after power on by blinking state.	Blinks
D112	TRVR	Amber	Lights when the tracking VR is enable.	Stays unlit
D301	DRUM	Amber	Blinks during the drum microcomputer (IC314 on SS-63 board) under normal operation. Usually lights for 30 ms at intervals of 1.1 to 1.5 s. The blinking interval is inverted when the drum is locked.	Blinks
D1102	SY1 STS1	Green	Blinks when SYS1 CPU operates normally.	Blinks
D1103	SY1 STS2	Green	Lights when between SYS1 and KEY PANEL (KY-364) communicates normally. Turn off when between SYS1 and KEY PANEL (KY-364) communicates abnormally.	Lights
D1104	MAINTE	Green	Lights during maintenance mode is performed.	Stays unlit
D1105	SY1 ERR	Red	Lights SYS1 CPU does not operate normally. Blinks when between SYS1 CPU and other CPU (SYS2, KY, etc.) commmunicates abnormally.	Stays unlit
D1902	SY2 STS1	Green	Blinks when SYS2 CPU operates normally.	Blinks
D1903	SY2 STS2	Green	Lights when between SYS2 and SV CPU communicates normally. Turn off when between SYS2 and SV CPU communicates abnormally.	Lights
D1904	SY2 STS3	Green	Lights when between SYS2 and SYS1 CPU communicates normally. Turn off when between SYS2 and SYS1 CPU communicates abnormally.	Lights
D1905	SY2 ERR	Red	Lights when SYS2 CPU does not operate normally. Blinks when between SYS2 CPU and other CPU (SYS1, SV, etc.) communicate abnormally.	Stays unlit

### Blinking pattern of D108 on SS-63 board





### DM-89 board

LED No.	Name	Color	Description	Normal state
D902	ADJUST	Amber	Usually lights for scores of milliseconds at intervals of about 1 s. The blinking interval is inverted when the DM-89 board is in the adjustment mode: when switch S901-1 on DM-89 board is set to ON.	Blinks



### TBC-23 board

LED No.	Name	Color	Description	Normal state
D200	TBC	Amber	Lights once a second during TBC microcomputer (on TBC-23 board) operates under normal condition.	Blinks

## 2-12. How to Take out the Cassette when the Tape is Slacking

**Note**

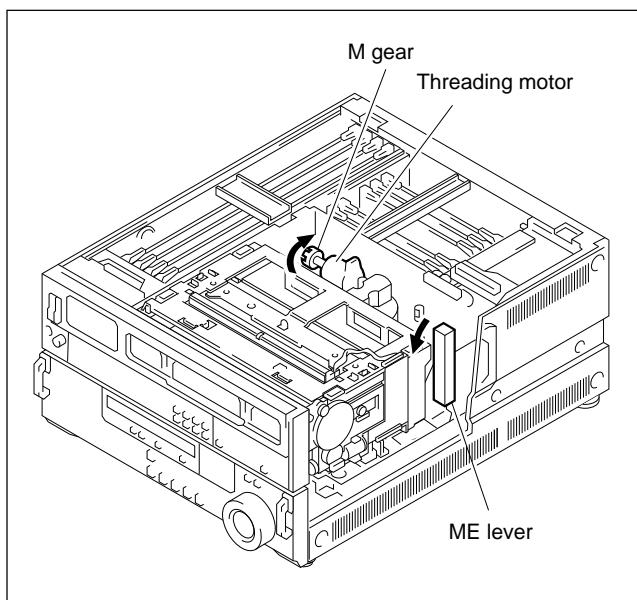
Turn off the power and unplug the power cord before starting the working.

When the tape is slacked in this unit, take out the cassette tape in the procedure below.

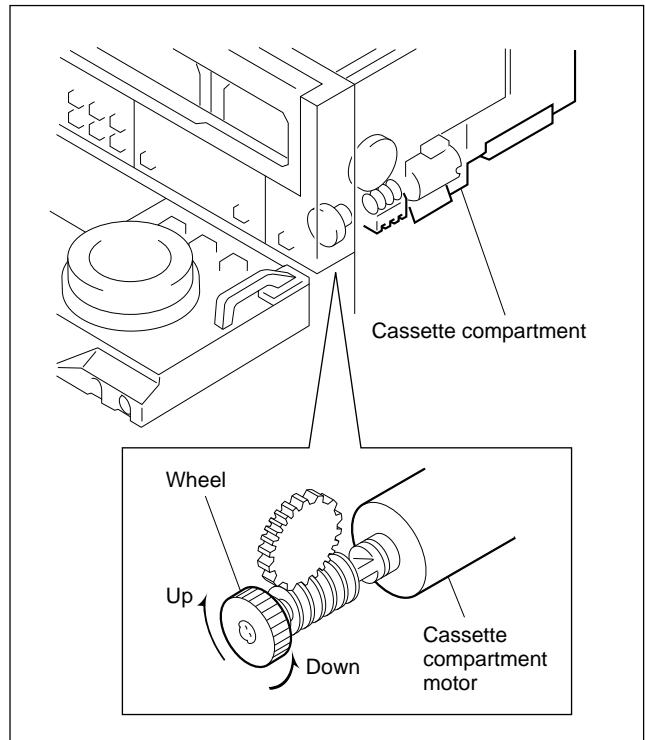
**Note**

The tape may be damaged. Take out the cassette tape with care.

- (1) Turn off the power switch.
- (2) Remove the upper lid.  
(Refer to “2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation”).
- (3) Remove the plate MD assembly.  
(Refer to “2-4. Plate MD Assembly Removal/Installation”).
- (4) Rotate the M gear of the threading motor block in the direction of the arrow with fingers by about a half turn and slacken the tape.
- (5) Shift the ME lever toward the front panel side and wind the tape inside the cassette.



- (6) Repeat steps 4 and 5 until the tape is wound completely.
- (7) Take both side handles of a lower control panel and pull them slightly forward, then pull them more strongly. Then the lower control panel tilts upward (to 90° position).
- (8) Turn the wheel of the cassette compartment motor shown in the figure clockwise until the cassette is ejected completely.



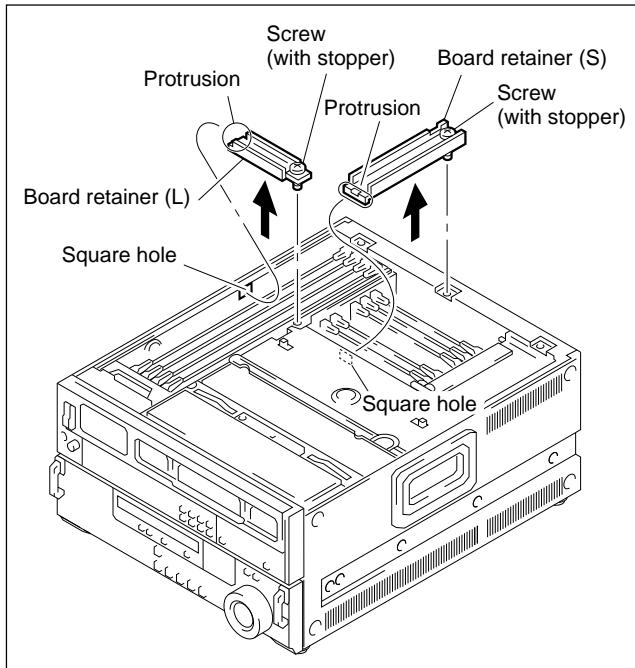
- (6) Repeat steps 4 and 5 until the tape is wound completely.
- (7) Take both side handles of a lower control panel and pull them slightly forward, then pull them more strongly. Then the lower control panel tilts upward (to 90° position).
- (8) Turn the wheel of the cassette compartment motor shown in the figure clockwise until the cassette is ejected completely.

## 2-13. Pulling out/Insertion of Plug-in Board

### Notes

- Turn off the power and unplug the power cord before starting the removal/installation.
- When the plug-in board is replaced, refer to Section 6 “Replacement of Plug-in Boards”.

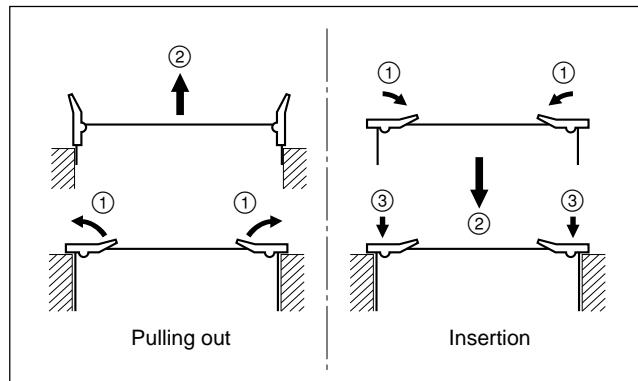
- (1) Remove the upper lid.  
(Refer to “2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation”.)
- (2) Loosen a screw, and remove the board retainer (L) or (S).



- (3) When removing the TBC-23 or TBC-24 board, disconnect the connected harness from its board.

TBC-23 board : CN1  
TBC-24 board : CN1

- (4) Pull up the eject levers on the board to the direction of the arrows. (Disconnect it from motherboard.)
- (5) Hold the eject levers and pull out slowly the board.



- (6) When removing the APR-12 or EQ-56 board, disconnect the connected harness from its board.

APR-12 board:	CN500 (A-1) .....	3P Red
	CN600 (G-1) .....	3P Yellow
EQ-56 board:	CN100 (B-7) .....	6P White
	CN500 (A-4) .....	4P White
	CN1500 (A-6) .....	4P Black

For insertion, perform in the reverse procedures of pulling out.

### Notes

- After board insertion, push the two eject levers simultaneously and connect the plug-in board firmly to the connector on the motherboard (MB-648 board).
- To install the board retainer, tighten the screw after inserting the protrusion of the board retainer into the square hole of chassis.

## 2-14. Fixtures and Adjustment Equipments List

### 2-14-1. Equipments for Adjustment

It is recommended to use the equipments listed below or the equivalents.

Each equipment is available as a standard product.

Equipment	Model name	Remarks
Spectrum analyzer	Advantest R3261A	With external trigger function bandwidth: more than 100 MHz
Oscilloscope	Tektronix 2465B	
Analog composite waveform /vector monitor	Tektronix 1750 or 1780R	For 525/60
	Tektronix 1751 or 1781R	For 625/50
Audio analyzer	Tektronix AA501A (OP.02)	For measuring distortion and levels
Audio level meter	Hewlett-Packard HP3400A	
Frequency counter	Advantest TR5821AK	
Digital voltmeter	Advantest TR6845	
Network analyzer	Anritsu MS-420B	
Terminator	—	75-ohm, BNC type
BNC T adapter	—	75-ohm

## 2-14-2. Fixtures

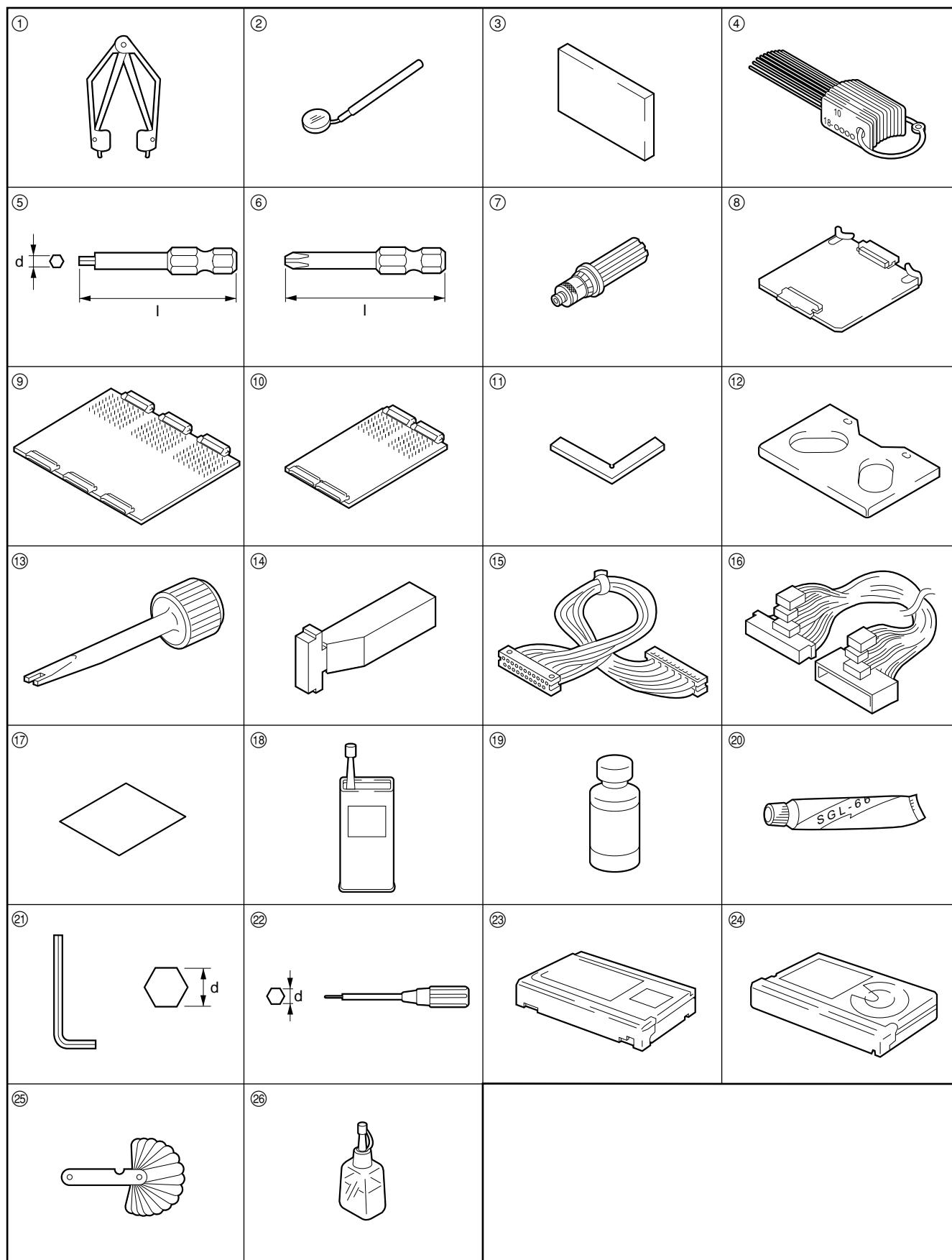
### Note

The tools that are used only in the maintenance manual part 2 are also described.

Fig. No.	Part No.	Description	[Inscription No.]	For use
1	J-6035-070-A	Extraction tool (for PLCC socket)	—	Extraction of IC (PLCC type)
2	J-6080-029-A	Small dental mirror (round type ø12)	—	Cassette pillar height adjustment
3	J-6086-570-A	Reference flat plate	[SL-657]	AT head zenith adjustment
4	J-6152-450-A	Wire clearance check gauge set	—	Clearance check
5	J-6251-090-A	Torque screwdriver's hexagonal bit (d=2.5 mm, l=120 mm)	—	Tightening screws to fix a drum assembly and upper drum assembly
	J-6323-440-A	Torque screwdriver's hexagonal bit (d=0.89 mm, l=90 mm)	—	Tightening screws to fix a tension regulator roller
6	J-6323-420-A	Torque screwdriver's bit (+2 mm, l=75 mm)	—	Tightening screws to fix a brush/slip ring assembly
	J-6323-430-A	Torque screwdriver's bit (+3 mm, l=90 mm)	—	Tightening screws to fix a reel motor assembly or a ring roller
7	J-6252-510-A	Torque screwdriver (6 kg·cm)(0.6 N·m)	[JB-5251]	Tightening screws
	J-6252-520-A	Torque screwdriver (12 kg·cm)(1.2 N·m)	[JB-5252]	Tightening screws
8	J-6269-810-A	Extension board (S), EX-377	—	Extension of the small-sized plug-in board (DM, TBC)
9	A-8277-211-A	Extension board (L), EX-555	—	Extension of the large-sized plug-in board
10	A-8277-212-A	Extension board (S), EX-556	—	Extension of the small-sized plug-in board (EQ, APR)
11	J-6320-870-A	Reel motor shaft slantness check fixture	[MW-087]	Reel motor shaft slantness adjustment
12	J-6320-880-A	Cassette reference plate (L)	[MW-088]	Reel table height adjustment, Reel motor shaft slantness adjustment
13	J-6322-610-A	Tape guide adjustment driver	[MW-261]	Tape path adjustment
14	J-6329-350-A	Reel table height gauge	[MW-935]	Reel table height adjustment
15	1-952-684-11	Extension cable (14P)	—	Extension of the TBC-23 or TBC-24 board
16	1-957-071-11	Extension cable set	—	Extension of the power supply unit
17	3-184-527-01	Cleaning cloth (15 cm × 15 cm)	—	Cleaning
18	7-432-114-11	Locking compound (200 g)	—	Inhibits loosening of screws
19	7-661-018-18	Diamond oil NT-68 (50 ml)	—	
20	7-651-000-10	Sony grease SGL-601 (50 g)	—	
21	7-700-736-01	L-shaped hexagonal wrench (d=1.27 mm)	—	
	7-700-736-05	L-shaped hexagonal wrench (d=1.5 mm)	—	
	7-700-736-06	L-shaped hexagonal wrench (d=0.89 mm)	—	
22	7-700-766-04	Hexagonal wrench driver (d=2.5 mm)	—	
23	8-960-075-01	Alignment tape, SR5-1	—	Video/audio alignments (for 525/60 system)
	8-960-075-11	Alignment tape, SR2-1	—	Servo alignments (for 525/60 system)
	8-960-075-51	Alignment tape, SR5-1P	—	Video/audio alignments (for 625/50 system)
	8-960-075-61	Alignment tape, SR2-1P	—	Servo alignments (for 625/50 system)
24	*1 8-960-096-01	Alignment tape, CR2-1B	—	Tracking adjustment (for analog Betacam NTSC) *1
	*1 8-960-096-41	Alignment tape, CR5-1B (metal particle tape)	—	Video alignments (for analog Betacam NTSC) *1
	*2 8-960-096-51	Alignment tape, CR2-1B PS	—	Tracking adjustment (for analog Betacam PAL) *2
	*1 8-960-097-44	Alignment tape, CR5-2A (oxide tape)	—	Video alignments (for analog Betacam NTSC) *1
	*1 8-960-097-45	Alignment tape, CR8-1A (oxide tape)	—	Audio alignments (for analog Betacam NTSC) *1
	*2 8-960-096-91	Alignment tape, CR5-1B PS (metal particle tape)	—	Video alignments (for analog Betacam PAL) *2
	*2 8-960-096-86	Alignment tape, CR8-1B PS (metal particle tape)	—	Audio alignments (for analog Betacam PAL) *2
	*2 8-960-098-44	Alignment tape, CR5-2A PS (oxide tape)	—	Video alignments (for analog Betacam PAL) *2
	*2 8-960-098-45	Alignment tape, CR8-1A PS (oxide tape)	—	Audio alignments (for analog Betacam PAL) *2
25	9-911-053-00	Thickness gauge	—	Clearance check
26	9-919-573-01	Cleaning liquid	—	Cleaning

\*1: DNW-A22 only

\*2: DNW-A22P only



## 2-15. ISR

### 2-15-1. Overview

This unit corresponds to ISR (Interactive Status Reporting) function. When this unit is connected to the personal computer which activates Sony's ISR application software, the status of this unit or the contents of a generated error can be intensively monitored and managed on the monitor screen of a personal computer. The data displayed on the monitor screen can be stored as a file.

**Note**

Please contact to Sony's service organization about ISR application software, method of using or installing the personal computer which can use this software, and the method of concrete operating.

The major functions are as shown below.

#### Monitor functions

- Error code and error message (Refer to Section 3.)
- Display of operation status (Equivalent to the display on the video monitor.)

#### Management functions

- Model name, serial No., destination
- ROM version

Indicating item	Description
Manufacture	Displayed as SONY.
Model name	Displays the model name.
Serial No.	Displays the serial No.
Device ID	Can give an arbitrary name to this unit and register it.
Destination	Displays the destination J (For Japan), SY (For world-wide)
ROM	Displays the information of the ROMs mounted in this unit.

#### Inspection functions

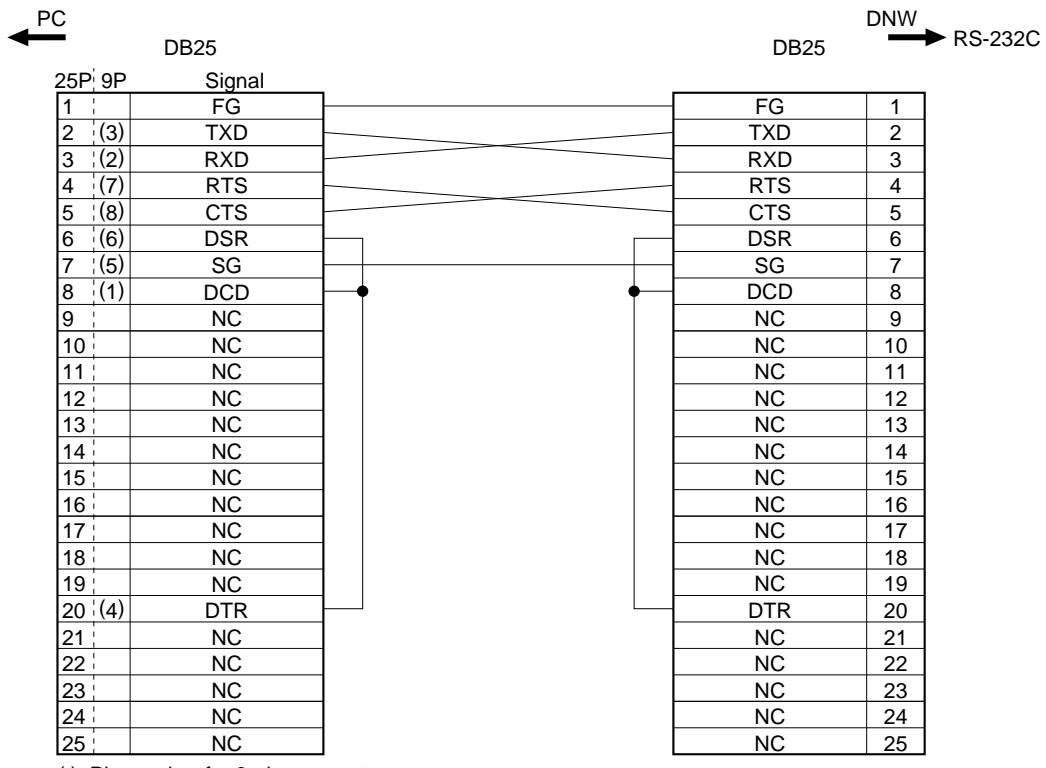
- Hours meter (Equal to hours meter of the setup menu)
- Error logger

## 2-15-2. Information of Connecting Cable

Prepare the cables by refering the following information.

### 1. For connecting directly to a personal computer

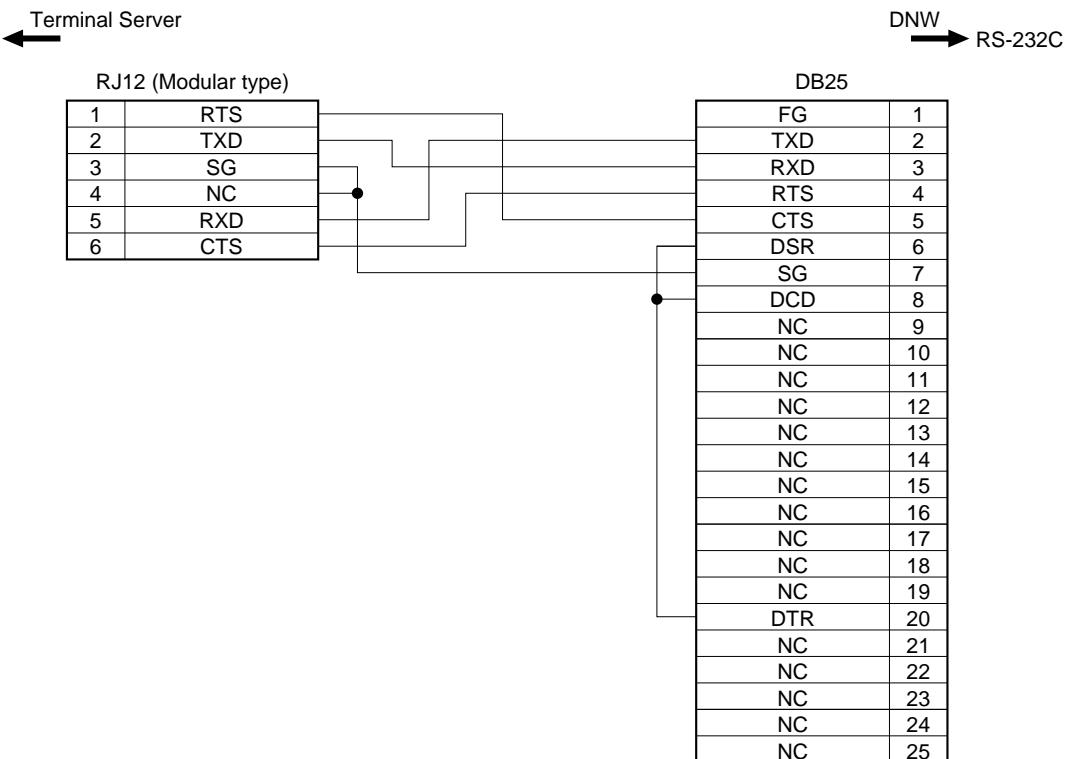
Use the RS-232C cross cable.



## 2. For connecting to a personal computer via LAN (Terminal server: 6-pin port)

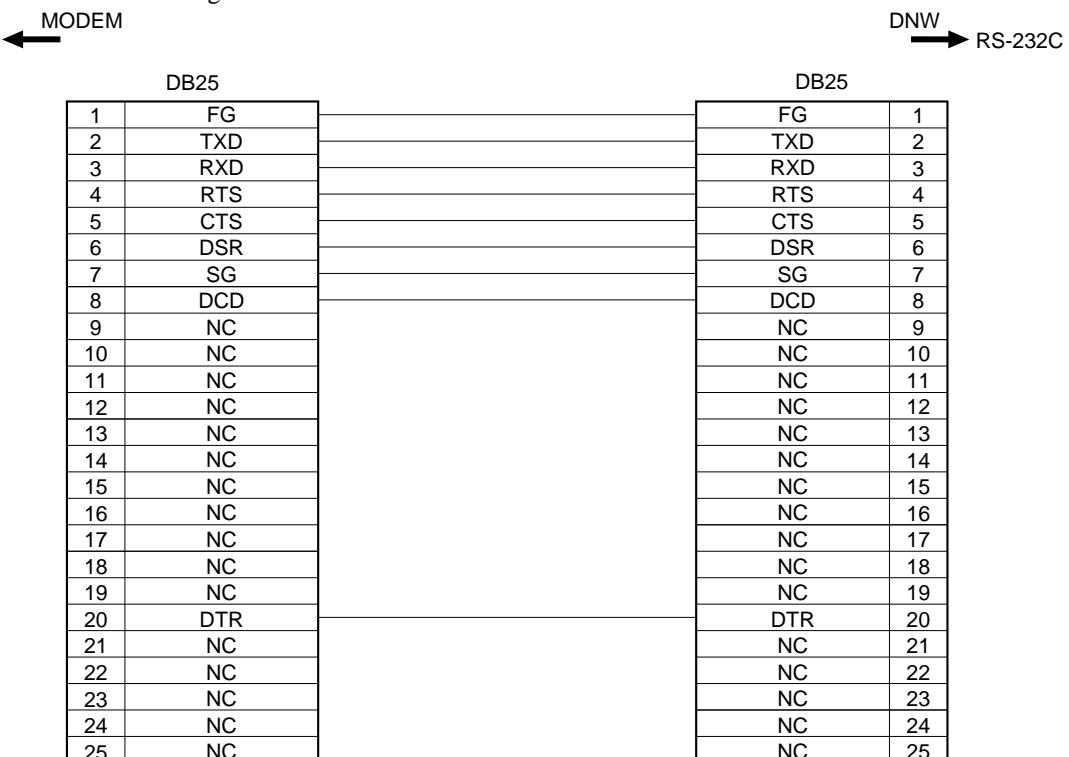
### Note

The connection varies depend on the terminal server. Be sure to check the pin assignment of terminal server side, and follow it.



## 3. For connecting to a personal computer via modem

Use the RS-232C straight cable.



## Section 3

### Error Message

#### 3-1. Overview of Error Message

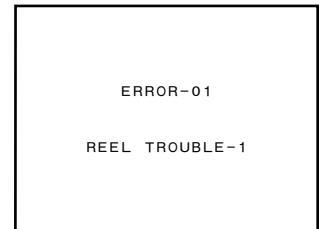
This unit has self-diagnostics function.

When trouble is detected, an ALARM indicator is lighted immediately on the lower control panel, and an error message and error code are displayed in the time data display area and event display area.

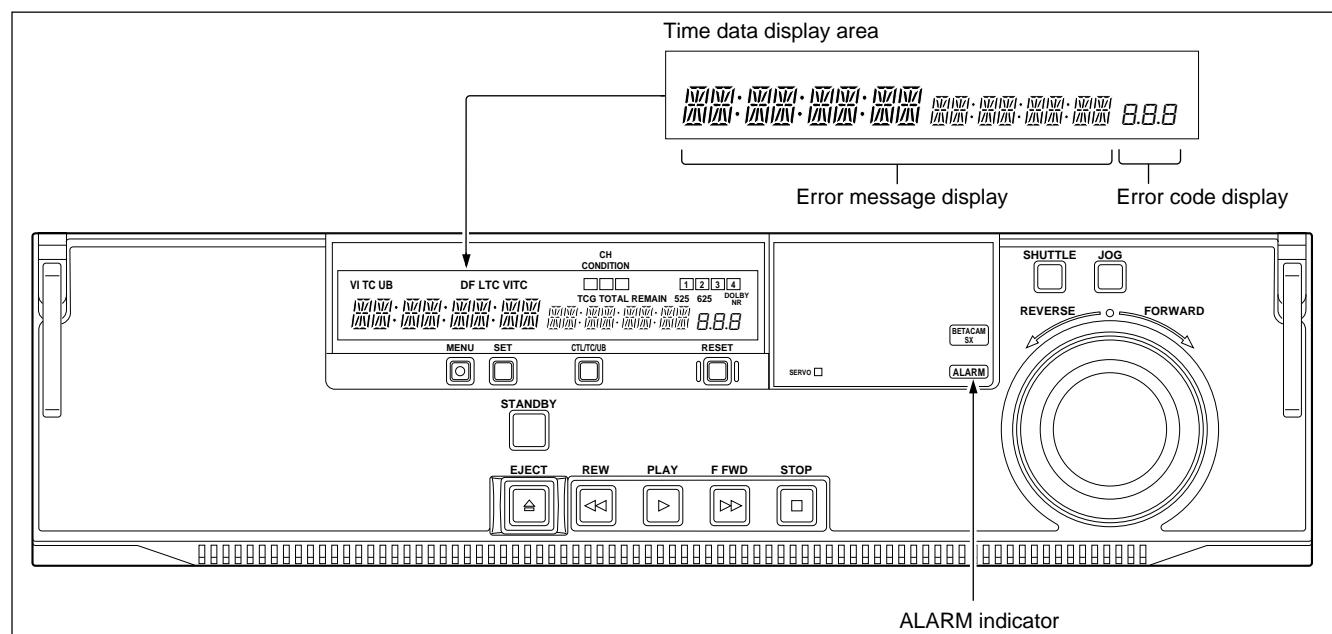
Also, an error code and error message are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 2 connector. Furthermore, as for the some error codes, object which error occurred is displayed as sub error message on the video monitor.

#### Notes

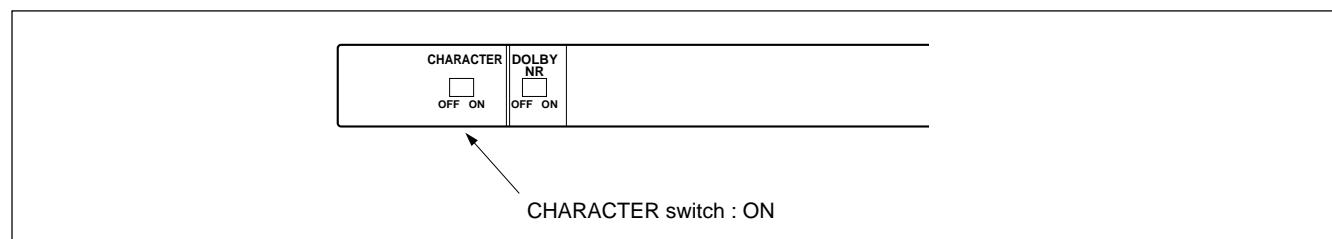
- To superimpose the error message and code on the video monitor, the CHARACTER switch on the sub control panel must be set to ON.
- There are the error messages without error code. These messages are only displayed on the time data display area.
- The error messages with error code are recorded to NV-RAM (Non-volatile RAM) as the error logging data.  
(Refer to Section 4 for the error logging data.)
- The messages on the time data display area differ from the messages which are superimposed on the video monitor in some items.



Ex. Superimposed  
on Video Monitor



Error Message/Code Display Area and ALARM Indicator



CHARACTER Switch on Sub Control Panel

Error messages are described on Section 3-2 in the order of list.

## Error List

Code	Message on time data display area	Page	Description
-	NO COMMUNICATION	3-4	Abnormality in the interface between the lower control panel (KY-364 board) and SYS1 CPU (SS-63 board) is detected in the lower control panel side.
01	REEL TROUBLE	3-4	Tape slackening is detected in the threading or unthreading operation.
02	REEL TROUBLE	3-5	Tape slackening or tape breaking is detected in the SEARCH, FF, or REW mode.
03	REEL TROUBLE	3-6	Tape slackening, tape breaking, or supply or take-up reel locking is detected in the PLAY mode.
04	REEL TROUBLE	3-7	An malfunctional tape transport speed is detected in the FF or REW mode.
05	REEL TROUBLE	3-7	The malfunctional operation of the supply or take-up reel is detected during cassette insertion.
06	TAPE TENSION	3-8	Excessive tape tension is detected in the PLAY mode.
07	CAPSTAN TROUBLE	3-8	Malfunction of capstan motor is detected.
08	DRUM TROUBLE	3-9	Malfunction of drum motor is detected.
09	TH/UNTH MOTOR	3-9	Malfunction of threading or unthreading operation is detected.
0A	THREADING	3-10	It is detected that the tape top processing is not completed in the threading mode.
10	HUMID	3-10	Dew condensation is detected.
11	TAPE T/E SENSOR	3-11	The tape top and tape end are detected simultaneously.
12	TAPE TOP SENSOR	3-11	Malfunction of tape top sensor is detected.
13	TAPE END SENSOR	3-12	Malfunction of tape end sensor is detected.
14	FAN MOTOR	3-13	Malfunction of cooling fan  motor is detected.
20	CASS COMP MOTOR	3-14	Malfunction of cassette compartment-up or down operation is detected.
21	REEL SFT MOTOR	3-14	Malfunction of movement of the reel table corresponding to the cassette size is detected.
22	REEL POS SENSOR	3-15	The L-cassette and S-cassette positions of the reel table are detected simultaneously.
23	THRED RING SENS	3-15	The thread end and unthread end states of the threading ring are detected simultaneously.
92	INTERNAL I/F 1	3-16	Abnormality in the interface between SYS1 CPU (on SS-63 board) and other CPU/MPU is detected.
96	SY NV-RAM ERROR	3-17	The abnormal operation of an NV-RAM (on SS-63 board) for the system control system is detected.
97	SV NV-RAM	3-18	The abnormal operation of an NV-RAM (on MS-50 board) for the servo system is detected.
98	RF NV-RAM ERROR	3-18	The abnormal operation of an NV-RAM (on EQ-56, DM-89, or TBC-23 board) for the RF system is detected.
99	INTERNAL I/F 2	3-19	Abnormality in the interface between SYS2 CPU (on SS-63 board) and SERVO CPU (on SS-63 board) or MPU (on EQ-56, DM-89, or TBC-23 board) is detected.

### Notes

- Error codes 01 through 14 detect in both/one of the SS-63 and/or MS-50 boards.  
Error codes 20 through 23 detect in the MS-50 board.  
Error codes 92 through 99 detect in the SS-63 board.
- There are two error groups of error codes: VTR and OTHERS. If errors occur in both error groups, the error message of each group are switched at two-second intervals.  
Also, if multiple errors occur in error group, the priority level of each group display are as follows:  
VTR: 97, 02, 03, 04, 05, 07, 06, 01, 09, 08, 0A, 10, 11, 12, 13, 14, 20, 21, 22, 23  
OTHERS: 92, 96, 98, 99

## 3-2. Details of Error Messages

### CAUTION

The “protection mode” described in this section means the servo control system automatically stops the tape transport and drum motor rotation, and maintains this state. The DNW cannot be automatically recovered to the normal state when the DNW once enters the protection mode. Be sure to turn the power on again under the absence of the cassette tape.

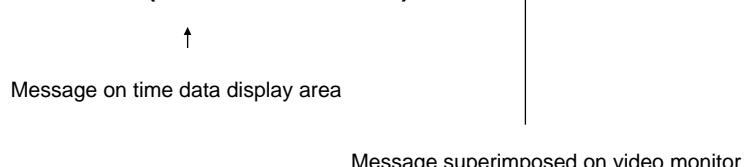
If the protection mode is entered with the cassette tape inserted, take out the cassette tape manually with reference to “2-12. How to Take Out the Cassette when the Tape is Slacking”. Never turn the power on again without taking out the cassette tape. This may damage the tape.

### Note

The messages on the time data display area differ from the messages which are superimposed on the video monitor in some items. In this section, each message indicates as following example.

---

### Ex.: ERROR-23 THREADING RING POSITION ERROR (THRED RING SENS)



---

**(NO COMMUNICATION)**

Description: Abnormality in the interface between the lower control panel's MPU (on the KY-364 board) and SYS1 CPU (SS-63 board) was detected.

**Note**

This error message is only displayed on the time data display area in that the abnormality of the interface is detected in the lower control panel side.

Detecting condition: When the lower control panel's MPU (IC104 on KY-364 board) is received no interface signal from SYS1 CPU (IC704 on SS-63 board) for more than two seconds.

Possible causes:

- Cable connection defect or disconnection
- Line receiver/transceiver (IC102 on KY-364 board) trouble
- SIO (IC1102 on SS-63 board) trouble

Protecting operation: None

---

**ERROR-01 REEL TROUBLE - 1  
(REEL TROUBLE)**

Description: Tape slacking was detected during threading or unthreading.

Detecting conditions:

- 1) When no take-up reel FG can be detected in the unthread operation just after activation.
- 2) When the relation between the take-up reel FG and threading FG is out of the specification in operations other than unthread just after activation.

Sub error message: None

Possible causes:

- Cassette compartment trouble or installation defect
  - \* The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of take-up reel FG detection block
- Take-up reel FG waveform shaper circuit (MS-50 board) trouble
- Take-up reel motor trouble
- Take-up reel motor drive circuit (DR-315 board) trouble
- Take-up reel brake trouble
- Take-up reel brake solenoid drive circuit (MS-50 board) trouble
- Servo adjustment defect on take-up reel
- Harness disconnection
- Take-up reel table height adjustment defect

Protecting operation: Enters the protection mode.

**CAUTION**

Be sure to take out the cassette manually (refer to Section 2-12). Do not turn the power on again without taking out the cassette. This may damage the tape.

---

## ERROR-02 REEL TROUBLE - 2 (REEL TROUBLE)

Description: Tape slackening or tape breaking was detected in SEARCH, FF, or REW mode.

Detecting conditions:

- 1) When the take-up value is lower than the specified value with respect to the tape supply value.
- 2) When the relation among the capstan FG, supply reel FG, and take-up reel FG are out of the specification.
- 3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.

Sub error message: None

Possible causes:

- Cassette compartment trouble or installation defect
  - \* The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel FG waveform shaper circuit (MS-50 board) trouble
- Supply or take-up reel motor trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan FG waveform shaper circuit (MS-50 board) trouble
- Take-up torque insufficiency during REW due to supply tension sensor or supply tension detect circuit (MS-50 board) trouble
- Servo adjustment defect on capstan, reel(s), and supply tension sensor
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-50 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Enters the protection mode. The normal state may be returned after the protection mode is entered at the end of the tape.

**CAUTION**

Be sure to take out the cassette manually (refer to Section 2-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

---

### ERROR-03 REEL TROUBLE - 3 (REEL TROUBLE)

Description: Tape slackening, tape breaking, or supply or take-up reel locking was detected in the PLAY mode.

Detecting conditions:

- 1) When the take-up value is lower than the specified value with respect to the tape supply value.
- 2) When the relation among the capstan FG, supply reel FG, and take-up reel FG are out of the specification.
- 3) When the supply reel and take-up reel do not coincide in rotation direction continuously for more than five seconds.
- 4) When the tension value calculated from the supply tension sensor output is less than 15 g continuously for more than three seconds.

Sub error message: None

Possible causes:

- Cassette compartment trouble or installation defect
  - \* The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel FG waveform shaper circuit (MS-50 board) trouble
- Supply or take-up reel motor trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Capstan motor trouble
- Capstan motor drive circuit (DR-315 board) trouble
- Capstan FG waveform shaper circuit (MS-50 board) trouble
- Servo adjustment defect on capstan, reel(s), and supply tension sensor
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-50 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Enters the protection mode.

**CAUTION**

Be sure to take out the cassette manually (refer to Section 2-12). Do not turn on the power again without taking out the cassette. This may damage the tape.

---

## **ERROR-04 REEL TROUBLE - 4 (REEL TROUBLE)**

Description: Abnormal tape transport speed was detected in the FF or REW mode.

Detecting condition: When the tape speed calculated from the supply reel FG and take-up reel FG is under a half of the specified tape speed continuously for more than four seconds.

Sub error message: None

Possible causes:

- Cassette compartment trouble or installation defect
  - \* The reel did not rotate because the cassette was lifted-up from the specified position.
- Clearance adjustment defect of supply or take-up reel FG detection block
- Supply or take-up reel motor trouble
- Supply or take-up reel FG waveform shaper circuit (MS-50 board) trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply or take-up reel
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-50 board) trouble
- Harness disconnection
- Reel table height adjustment defect
- Tape path and drum troubles
- Tape abnormality (The winding state has a problem.)

Protecting operation: Stops the tape transport and enters the rest state.

---

## **ERROR-05 REEL TROUBLE - 5 (REEL TROUBLE)**

Description: Abnormal supply reel or take-up reel operation was detected in a diagnosis during cassette insertion.

Detecting conditions:

- 1) When the supply reel FG or take-up reel FG count is less than the specified value with the reel rotated.
- 2) When the supply reel FG or take-up reel FG count is more than the specified value with the reel stopped.

Sub error message: None

Possible causes:

- Supply or take-up reel FG sensor (SE-344 board) trouble or clearance adjustment defect
- Supply or take-up reel FG waveform shaper circuit (MS-50 board) trouble
- Supply or take-up reel motor drive circuit (DR-315 board) trouble
- Servo adjustment defect on supply or take-up reel
- Supply or take-up reel brake trouble
- Supply or take-up reel brake solenoid drive circuit (MS-50 board) trouble
- Harness disconnection

Protecting operation: Ejects the cassette.

---

## **ERROR-06 TAPE TENSION ERROR (TAPE TENSION)**

Description:	Excessive tension was detected in the PLAY mode.
Detecting condition:	When the tension value calculated from supply tension sensor output is more than 55 g continuously for more than three seconds.
Sub error message:	None
Possible causes:	<ul style="list-style-type: none"><li>• Cassette compartment trouble or installation defect<ul style="list-style-type: none"><li>* The reel did not rotate because the cassette was lifted-up from the specified position.</li></ul></li><li>• Supply tension sensor or its related circuit (MS-50 board) trouble</li><li>• Supply reel motor trouble</li><li>• Supply reel motor drive circuit (DR-315 board) trouble</li><li>• Servo adjustment defect on supply reel and supply tension sensor</li><li>• Supply reel brake trouble</li><li>• Supply reel brake solenoid drive circuit (MS-50 board) trouble</li><li>• Harness disconnection</li></ul>
Protecting operation:	Stops the tape transport and enters the rest state.

---

## **ERROR-07 CAPSTAN TROUBLE (CAPSTAN TROUBLE)**

Description:	Malfunction of capstan motor was detected.
Detecting conditions:	<ol style="list-style-type: none"><li>1) When the capstan FG count is less than the specified value in a diagnosis during cassette insertion.</li><li>2) When the frequency calculated from the capstan FG is out of the specification in the PLAY, or SEARCH mode.</li><li>3) When CAPSTAN FG(A) NOR signal and CAPSTAN FG(B) NOR signal interruption are not normal for about 40 ms in the PLAY mode.</li></ol>
Sub error message:	None
Possible causes:	<ul style="list-style-type: none"><li>• Capstan motor trouble</li><li>• FG sensor trouble in capstan motor</li><li>• Capstan motor drive circuit (DR-315 board) trouble</li><li>• Capstan motor FG waveform shaper circuit (MS-50 board) trouble</li><li>• Capstan FG duty adjustment defect</li></ul>
Protecting operations:	Ejects the cassette for No. 1 in detecting conditions. Stops the tape transport and enters the rest state for No. 2 and No. 3 in detecting conditions.

---

## **ERROR-08 DRUM TROUBLE (DRUM TROUBLE)**

- Description: Malfunction of drum motor was detected.
- Detecting condition: When the drum FG cycle is shifted more than about  $\pm 30\%$  continuously for more than 10 seconds as compared with during normal rotation.
- Sub error message: None
- Possible causes:
- Drum motor trouble
  - Drum microcomputer (IC314 on SS-63 board) trouble
  - Drum motor drive circuit (DR-315 board) trouble
  - Drum FG/PG waveform shaper circuit (DR-315 board) trouble
  - Assembly defect during upper drum replacement
- Protecting operation: Stops the tape transport and enters the rest state in the unthread end state.

---

## **ERROR-09 TH/UNTH MOTOR TIMEOUT (TH/UNTH MOTOR)**

- Description: Malfunction of threading or unthreading operation was detected.
- Detecting conditions:
- 1) When no operation is completed within about six seconds after operation start.
  - 2) When no threading FG is output within about 0.4 second during threading motor drive.
  - 3) When states other than unthread end are continued for more than six seconds in case that the unit should be in the unthread end state.
- Sub error message: None
- Possible causes:
- Unthread end sensor (TR-79 board) trouble
  - Thread end sensor (TR-79 board) trouble
  - Thread end/unthread end input port (IC1 on MS-50 board) trouble
  - Threading motor trouble
  - Threading FG sensor (PTC-54 board) trouble
  - Threading FG waveform shaper circuit (MS-50 board) trouble
  - Threading motor drive circuit (DR-315 board) trouble
  - Threading mechanism trouble
- Protecting operations:
- Ejects the cassette during cassette insertion or ejection.
  - Enters the protection mode during tape threading/unthreading.
  - Stops the tape transport and enters the rest state in cases except the above.

---

## **ERROR-0A THREADING TROUBLE (THREADING)**

Description: It was detected that the tape top processing in the thread state is not completed.

Detecting condition: When the tape top is detected again after it is processed.

### **Tape top processing**

In this processing, the tape is slightly forwarded without taking out the tape after unthread because the tape top was detected during threading.

(Short FF)

Sub error message: None

Possible causes:

- Take-up reel motor trouble
- Servo adjustment defect on take-up reel
- Take-up reel motor drive circuit (DR-315 board) trouble
- Tape top sensor trouble
- Tape top detection circuit (MS-50 board) trouble
- Tape top input port (IC115 on SS-63 board) trouble
- Tape abnormality

Protecting operation: Enters the rest state in the unthread end state.

---

## **ERROR-10 HUMID (HUMID)**

Description: Dew condensation was detected.

Detecting condition: When the condensation sensor detects dew condensation continuously for about two seconds.

Sub error message: None

Possible causes:

- Actual dew detection (When the operating environment rapidly changes from low temperature to high temperature and high humidity)
- Condensation sensor trouble
- Dew input port (IC1 on MS-50 board) trouble

Protecting operations:

- Prohibits the cleaning roller operation.
- Stops the tape transport and enters the rest state in the unthread end state when the tape is threaded in states other than PLAY mode.
- Prohibits the tape threading.
- Prohibits the cassette insertion.

---

## **ERROR-11 TAPE TOP-END SENSOR TROUBLE (TAPE T/E SENSOR)**

- Description: The tape top and tape end were detected simultaneously.
- Detecting condition: When the simultaneous detection of the tape end and tape top is continued for more than seven seconds.
- Sub error message: None
- Possible causes:
- Tape top sensor or tape end sensor trouble
  - Tape top or tape end detection circuit (MS-50 board) trouble
  - Tape top/tape end input port (IC115 on SS-63 board) trouble
  - Harness disconnection
- Protecting operation: Stops the tape transport and enters the rest state during tape transport.

---

## **ERROR-12 TAPE TOP SENSOR TROUBLE (TAPE TOP SENSOR)**

- Description: Malfunction of tape top sensor was detected.
- Detecting condition: When the tape top is detected continuously for more than seven seconds.
- Sub error message: None
- Possible causes:
- Tape top sensor trouble
  - Tape top detection circuit (MS-50 board) trouble
  - Tape top input port (IC115 on SS-63 board) trouble
  - Harness disconnection
  - The tape cannot move at the tape top due to troubles other than the tape sensor.
- Protecting operations:
- In the FF mode, continues the operation until the tape end is detected. Stops the tape transport and enters the rest state when the tape end is detected.
  - During tape transport in forward direction, the FF mode can be entered only while the total tape quantity is observed.
  - Stops the tape transport and enters the rest state during tape transport except the above.

---

## **ERROR-13 TAPE END SENSOR TROUBLE (TAPE END SENSOR)**

Description: Malfunction of tape end sensor was detected.

Detecting condition: When the tape end is detected continuously for more than seven seconds.

Sub error message: None

Possible causes:

- Tape end sensor trouble
- Tape end detection circuit (MS-50 board) trouble
- Tape end input port (IC115 on SS-63 board) trouble
- Harness disconnection
- The tape cannot move at the tape end due to troubles other than the tape sensor.

Protecting operations: In the REW mode, continues the operation until the tape top is detected. Stops the tape transport and enters the rest state when the tape top is detected.  
During the tape transport in reverse direction, the REW mode can be entered only while the total tape quantity is observed.  
Stops the tape transport and enters the rest state during tape transport except the above.



---

**ERROR-14 FAN MOTOR TROUBLE  
(FAN MOTOR)**

Description: Malfunction of cooling fan motor was detected.

**CAUTION**

If this error occurred, stop immediately operation of the unit, and turn off the power.

If the unit uses continuously under the fan is stopped state, overheating inside the unit can cause a fire or a failure.

Detecting condition: When the fan motor FG frequency is less than the specified value continuously for more than one second.

Sub error message: None

Possible causes:

- Fan motor trouble
- Fan motor FG input port (IC115 or IC500 on SS-63 board) trouble
- Fan motor control port (IC500 on SS-63 board) trouble
- Fan motor power switch circuit (MB-648 board) trouble

Protecting operation: None

**Note**

This unit has four fan motors.

When the above detecting condition is satisfied by any fan motor, this error occurs.

Relations of fan motors and operation state, ports, power switch circuit are as follows.

Use	Operation state	FG input port	Control port	Power switch circuit
For rear	Always rotating	IC500/SS-63 board	None	None
For EQ-56 board	Always rotating	IC500/SS-63 board	IC500/SS-63 board	Q4 and Q5/MB-648 board
For mechanical deck	Always rotating	IC115/SS-63 board	IC500/SS-63 board	Q1 and Q2/MB-648 board
For power supply unit	Always rotating	IC115/SS-63 board	None	None

---

## **ERROR-20 CASSETTE COMPARTMENT MOTOR LOCK (CASS COMP MOTOR)**

Description: Malfunction of cassette compartment-up or down operation was detected.

Detecting condition: When no operation is completed within about six seconds after operation start.

Sub error message: None

Possible causes:

- Cassette compartment block trouble
- Cassette compartment motor drive circuit (DR-315 board) trouble
- Cassette-down sensor (CL-29 board) trouble
- Cassette-down input port (IC1 on MS-50 board) trouble

Protecting operation: Stops the movement of the cassette compartment and reel table until a cassette eject button is pushed.

---

## **ERROR-21 REEL SHIFT MOTOR LOCK (REEL SFT MOTOR)**

Description: Malfunction of movement of the reel table corresponding to the cassette size was detected.

Detecting condition: When no operation is completed within about six seconds after operation start.

Sub error message: None

Possible causes:

- Reel shift mechanism trouble
- Reel shift motor trouble
- Reel shift motor drive circuit (DR-315 board) trouble
- Reel position sensor (PTC-71 board) trouble (S position sensor or L position sensor)
- Reel position input port (IC1 on MS-50 board) trouble

Protecting operation: Stops the movement of the reel table and ejects the cassette during cassette loading.

---

**ERROR-22 REEL POSITION SENSOR TROUBLE  
(REEL POS SENSOR)**

Description: The L and S cassette positions of the reel table were detected simultaneously.

Detecting condition: When the L and S position sensors detect the L and S cassette positions, respectively at the same time.

Sub error message: None

Possible causes:

- S position sensor (PTC-71 board) trouble
- L position sensor (PTC-71 board) trouble
- Reel position input port (IC1 on MS-50 board) trouble

Protecting operation: If possible, ejects the cassette, when an error occurs during cassette insertion.  
Prohibits the cassette insertion.

---

**ERROR-23 THREADING RING POSITION ERROR  
(THRED RING SENS)**

Description: The thread end and unthread end states were detected simultaneously.

Detecting condition: When the thread end and unthread end sensors detect the thread end and unthread end states, respectively at the same time.

Sub error message: None

Possible causes:

- Thread end sensor (TR-79 board) trouble
- Unthread end sensor (TR-79 board) trouble
- Thread end or unthread end input port (IC1 on MS-50 board) trouble

Protecting operations: Ejects the cassette during cassette insertion or ejection.  
Enters the protection mode during tape threading/unthreading.  
Stops the tape transport and enters the rest state in cases except the above.

---

**ERROR-92 INTERNAL INTERFACE ERROR 1  
(INTERNAL I/F 1)**

Description: Abnormality was detected in the communication between SYS1 CPU (IC704 on SS-63 board) and other CPU/MPU.

Sub error messages and Detecting conditions:

**SY2:** When the SYS2 CPU (IC1505 on SS-63 board) initialization at turn on the power is in abnormal state.

**KY:** When the communication with KY-364 board's MPU (IC104) is in abnormal state.

**FP:** When the communication with FP-91 board's MPU (IC8) is in abnormal state.

Possible causes:

**SY2:**

- DIP switch (S1900 on SS-63 board) setting defect
- Common RAM (IC2501 on SS-63 board) or Common RAM controller (IC2500 on SS-63 board) trouble
- System control system SY-2 area (IC1500 series on SS-63 board) trouble

**KY:**

- Cable (between MB-648 board and KY-364 board) connection defect or disconnection
- Interface circuit (IC1102 through 1105 on SS-63 board) trouble
- Line receiver/transceiver (IC102 on KY-364 board) trouble
- KY-364 board's MPU (IC104) trouble

**FP:**

- Cable (between MB-648 board and FP-91 board) connection defect or disconnection
- MPU control interface circuit (IC1400 through 1402 on SS-63 board) trouble
- FP-91 board's MPU (IC8) trouble

Protecting operations: When the sub error message is “**SY2**”, enters the protection mode.  
When it is except above, displays only this error.

---

## **ERROR-96 SY NV-RAM ERROR (SY NV-RAM ERROR)**

Description: The abnormal operation of an NV-RAM (IC710 on SS-63 board) for the system control system was detected.

Sub error messages and Detecting conditions:

- CURRENT SETUP:** When the data error occurs in the setup menu current memory area during the data write or read .
- SETUP BANK1:** When the data error occurs in the setup menu bank 1 memory area during the data write or read.
- SETUP BANK2:** When the data error occurs in the setup menu bank 2 memory area during the data write or read.
- SETUP BANK3:** When the data error occurs in the setup menu bank 3 memory area during the data write or read.
- SETUP BANK4:** When the data error occurs in the setup menu bank 4 memory area during the data write or read.
- ID CODE:** When the data error occurs in the ID code memory area during the data write or read.
- CALENDAR CLOCK:** When the calendar/clock function stopped.

Possible causes:

- NV-RAM (IC710 on SS-63 board) trouble
- Address decoder (IC1107 on SS-63 board) trouble
- Backup battery inside NV-RAM is out of life

Protecting operations:

- When the error occurs in setting data of the setup menu, resets those data to the factory settings.
- When the error occurs in ID code data, resets the data to 00 00 00 00.
- When the error occurs at the calendar/clock function, resets the date and time data to '96 11 01 00 00 00 (= Year, Month, Day, Hour, Minute, Second).

---

**ERROR-97    SV NV-RAM ERROR  
(SV NV-RAM)**

Description:              The abnormal operation of an NV-RAM (MS-50 board) for the servo system was detected.

Detecting condition:    When the checksum of NV-RAM data does not coincide during activation.

Sub error message:     None

Possible cause:        NV-RAM (IC9 on MS-50 board) trouble

Protecting operation:   Enters the protection mode.

---

**ERROR-98    RF NV-RAM ERROR  
(RF NV-RAM ERROR)**

Description:              The abnormal operation of an NV-RAM (EQ-56, DM-89, or TBC-23 board) for RF system was detected.

Sub error messages and Detecting conditions:

**EQ:**    When the error occurs in an NV-RAM (IC900 on EQ-56 board) during the data write or read.

**DM:**    When the error occurs in an NV-RAM (IC908 on DM-89 board) during the data write or read.

**TBC:**   When the error occurs in an NV-RAM (IC200 on TBC-23 board) during the data write or read.

Possible causes:       Trouble of an NV-RAM indicated by sub error message

Protecting operation:   None

---

## ERROR-99 INTERNAL INTERFACE ERROR 2 (INTERNAL I/F 2)

Description: Abnormality was detected in the communication between SYS2 CPU (SS-63 board) and SERVO CPU (SS-63 board) or MPU (on EQ-56, DM-89, or TBC-23 board).

Sub error messages and Detecting conditions:

- SV:** When the SERVO CPU (IC1505 on SS-63 board) initialization at turn on the power is in abnormal state.
- EQ:** When the communication with EQ-56 board's MPU (IC908) is in abnormal state.
- DM:** When the communication with DM-89 board's MPU (IC906) is in abnormal state.
- TBC:** When the communication with TBC-23 board's MPU (IC202) is in abnormal state.

- Possible causes:
- SV:**
    - DIP switch (S101 on SS-63 board) setting defect
    - Common RAM (IC2502 on SS-63 board) or Common RAM controller (IC2503 on SS-63 board) trouble
    - Servo system (IC100 series or IC300 series on SS-63 board) trouble
  - EQ:**
    - MPU control interface circuit (IC2102, 2107, 2108 on SS-63 board) trouble
    - Interface buffers (IC901, 902, 905 on EQ-56 board) trouble
    - EQ-56 board's MPU (IC908) trouble
  - DM:**
    - MPU control interface circuit (IC2102, 2107, 2108 on SS-63 board) trouble
    - DM-89 board's MPU (IC906) trouble
  - TBC:**
    - MPU control interface circuit (IC2102, 2107, 2108 on SS-63 board) trouble
    - TBC-23 board's MPU (IC202) trouble

Protecting operations: When the sub error message is “**SV**”, enters the protection mode.  
When it is except above, displays only this error.



## Section 4

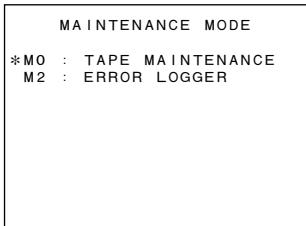
### Maintenance Mode

#### 4-1. Overview of Maintenance Mode

This unit has the maintenance mode that is useful during maintenance and trouble diagnosis.

This maintenance mode consists of the two modes below. The contents of the maintenance mode are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 3 connector.

(To superimpose the contents of the maintenance mode, set the CHARACTER switch on the subcontrol panel to ON.)



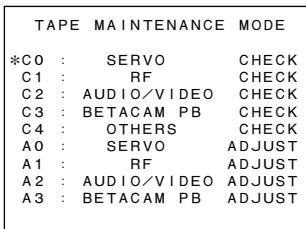
#### Note

The typeface of characters displayed on the video monitor differs from the actual one.

(Mode screen during activation of maintenance mode)

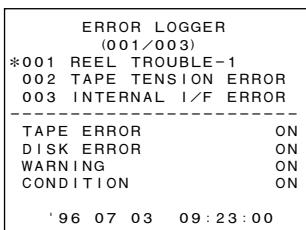
#### M0 : TAPE MAINTENANCE ..... (Section 4-2)

This mode is used for maintenance.



#### M2 : ERROR LOGGER ..... (Section 4-3)

This mode is used to display the record of errors (error logging) that occur in this unit.



#### Note

The display on the left is one of the displayed examples.

## Buttons and Switches for Operation

The main buttons and switches related to the operation of maintenance mode are as follows: The ordinary functions of these buttons and switches and how to use them are described below.

① Time data display area

The time data display area displays the menu (mode) No., menu title, selection item, status, or data. The menu (mode) No. or selection item block blinks while the menu (mode) or selection item is specified (not including the servo menu in the TAPE maintenance mode). For manual adjustment, the data block blinks. In the state where the tape operation (PB, F FWD, and REW) can be performed, the time data display area functions as an ordinary time counter.

There is a menu (mode) that contains insufficient information displayed in the time data display area. Since the information displayed on the superimpose picture is easier to operate and check, usually use a video monitor.

② MENU button

Push this button in the maintenance mode to return to the screen (state) preceding by one step.

The maintenance mode is terminated if this button is pushed when the mode screen is displayed (mode No. M0 or M2 blinks in a time data display area).

③ SET button

Push this button in the maintenance mode to select or execute the menu (mode) selected using a ⑧ search dial.

The maintenance mode can be activated when this SET button is pushed while pressing the ④ CTL/TC/UB button in the setup menu mode with ⑩ DIP switch S1100-2 on the SS-63 board set to ON (upper).

④ CTL/TC/UB button

The maintenance mode can be activated when the ③ SET button is pushed while pressing this button in the setup menu mode with ⑩ DIP switch S1100-2 on the SS-63 board set to ON (upper).

⑤ RESET button

Push this button in the error logger mode to erase the recorded error log.

⑥ STOP button

The data value of an electronic volume control can be displayed only while the STOP button is pressed in RF system automatic adjustment menu.

⑦ JOG button

The ⑧ search dial enters the JOG mode when this button is pushed (the lamp does not light in this case). The data value or setting can be changed when the ⑧ search dial is turned while pressing this button.

⑧ Search dial

Turn the search dial to specify the menu (mode) or selection item. A “\*” mark moves on the video monitor. In a time data display area, the display is replaced and the specified item blinks. (“JOG DIAL” is displayed on the video monitor.)

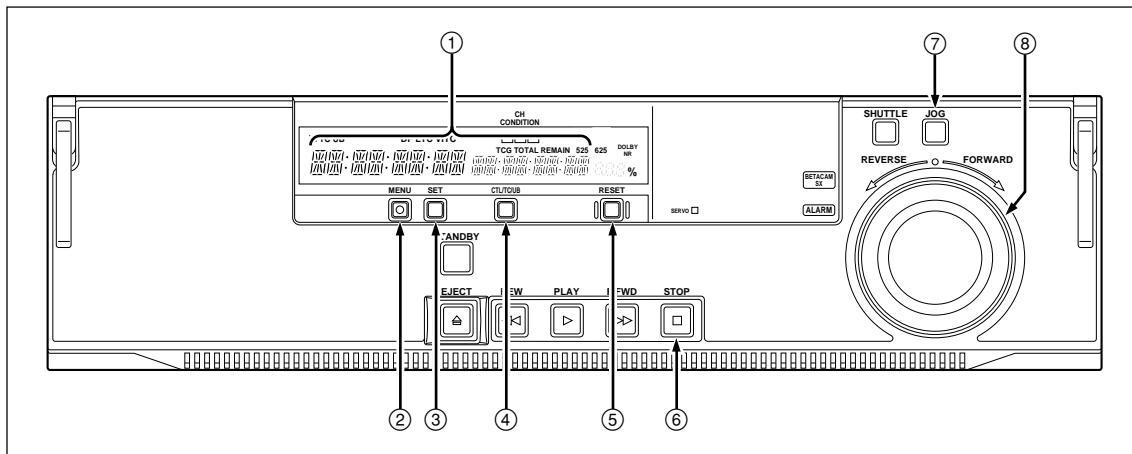
The data value or setting can be changed when the search dial is turned while pressing the ⑦ JOG button.

⑨ S1101/SS-63 board: Maintenance mode start switch (MAINTE MODE START)

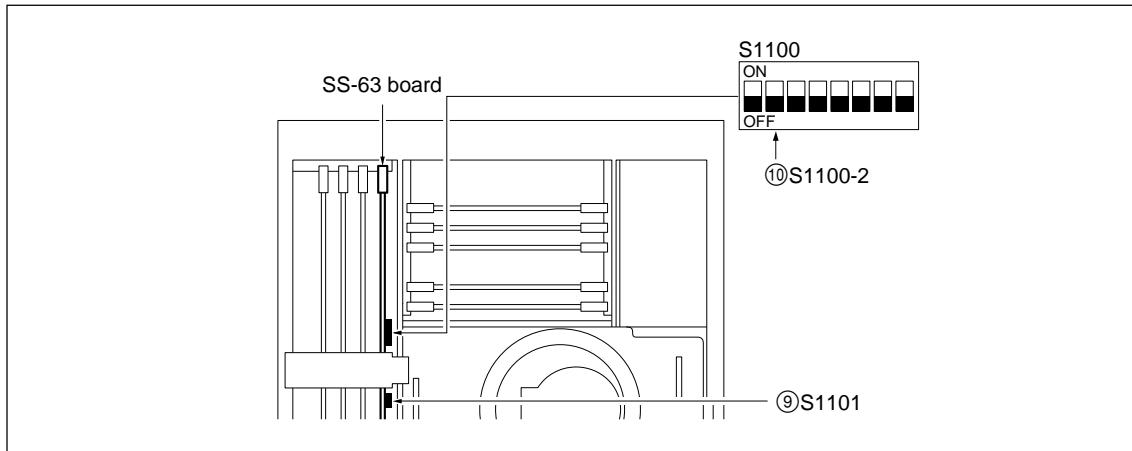
Push this switch to activate the maintenance mode.

⑩ S1100-2/SS-63 board: Maintenance mode access approval switch (MAINTE MODE Access)

Set this switch to ON (upper) in advance when activating the maintenance mode by the button operation on the control panel.



Lower Control Panel



Location of Switches on SS-63 Board

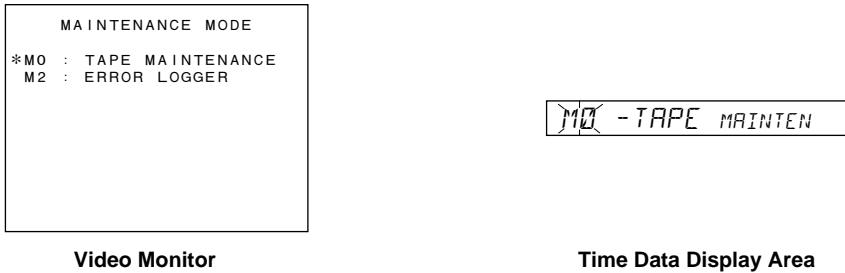
**Note**

Remove the upper lid referring to Section 2-3-1 when operating the switches on the SS-63 board. Change the setting of DIP switch S1100 with the power switch set to OFF.

## Activating the Maintenance Mode

- (1) Confirm that the video monitor is connected to the VIDEO OUTPUT COMPOSITE 3 connector.
- (2) Push the ⑨ S1101 switch (on the SS-63 board).
- (3) The mode screen in the maintenance mode is superimposed on the video monitor.

In a ① time data display area, “M0-TAPE MAINTEN” is displayed and the M0 block blinks.



## Activating the Maintenance Mode from Control Panel

The maintenance mode can be activated by the operation below when the S1100-2 switch (on the SS-63 board) is set to ON (upper).

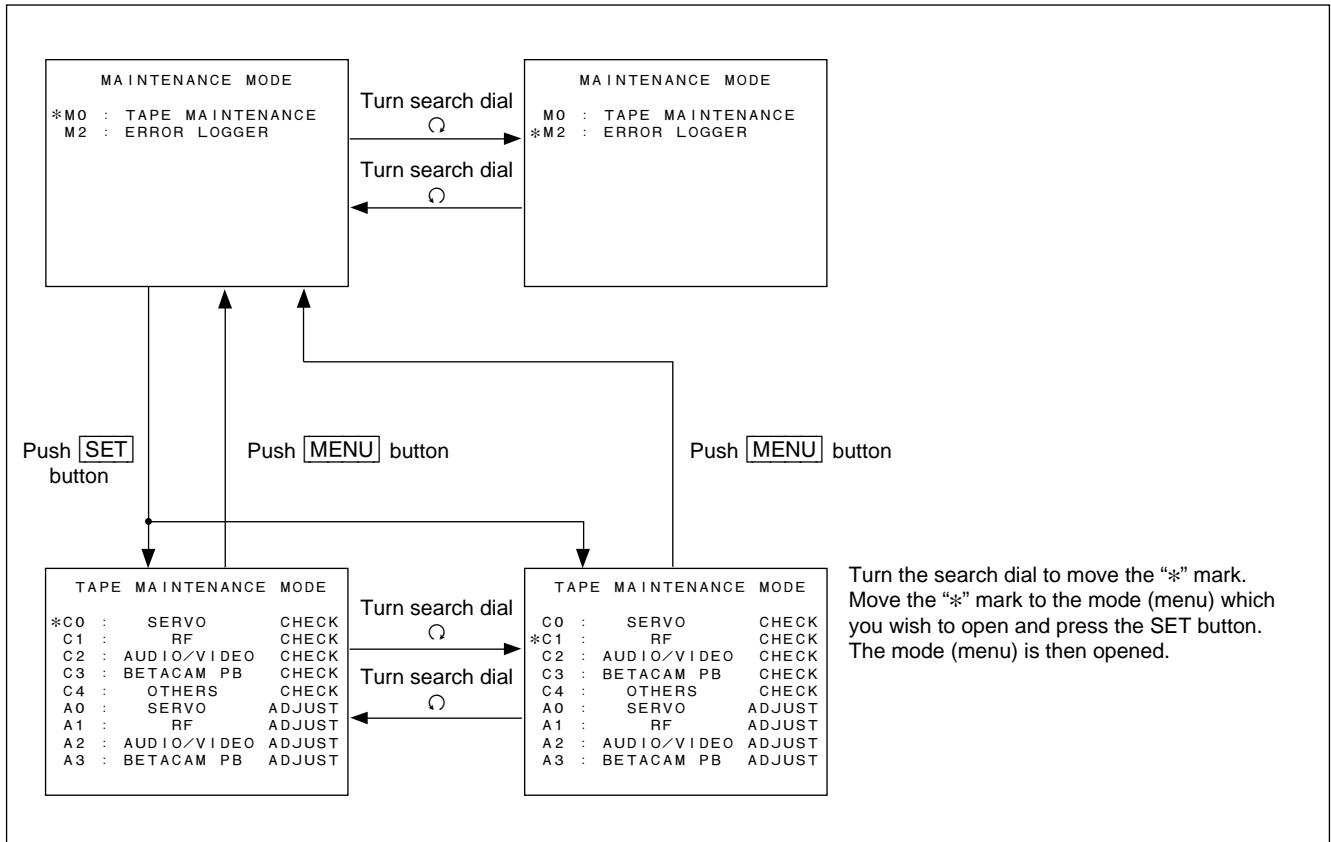
- (1) Push the ② MENU button once.  
(Execute the setup menu mode from the operation mode.)
- (2) Push the ③ SET button while pressing the ④ CTL/TC/UB button.  
(Execute the maintenance mode from the setup menu mode.)
- (3) The mode screen in the maintenance mode is displayed on the video monitor.

## Terminating the Maintenance Mode

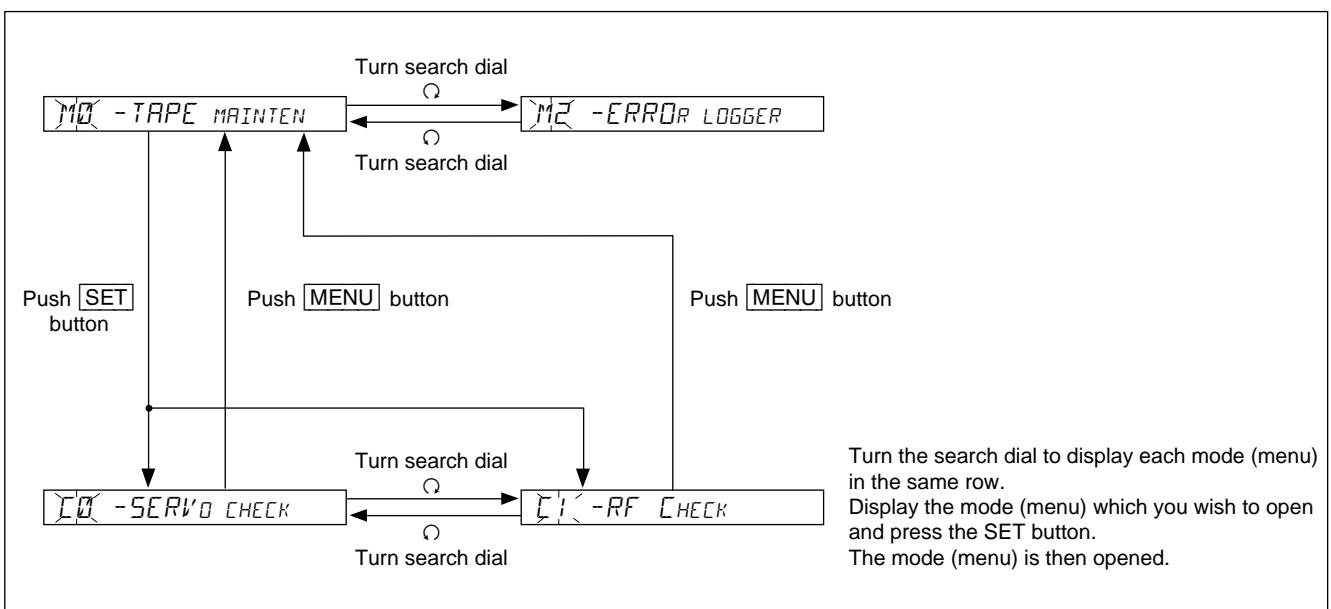
- (1) Push the ② MENU button several times to display the mode screen on the video monitor.  
The selected mode No. and title are displayed in a time counter.
- (2) Push the ② MENU button again to terminate the maintenance mode.

## Specifying the Menu (Mode) and Item

How to specify the menu (mode) and item using the search dial (JOG mode) is described below with the mode selection given as an example.



Example in Superimpose Picture



Example in Time Data Display Area

## 4-2. TAPE Maintenance Mode (M0)

### 4-2-1. Overviews

The TAPE maintenance mode is used for the maintenance and check.

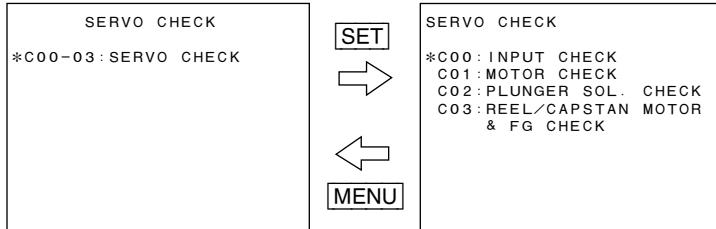
Nine submodes are available for DNW-A22/A22P.

TAPE MAINTENANCE MODE		
*C0	SERVO	CHECK
C1	RF	CHECK
C3	BETACAM PB	CHECK
C4	OTHERS	CHECK
A0	SERVO	ADJUST
A1	RF	ADJUST
A2	AUDIO/VIDEO	ADJUST
A3	BETACAM PB	ADJUST

#### TAPE Maintenance Mode

### C0 : SERVO CHECK

This submode is used to check the servo system. For more details, refer to Section 4-2-2 (on page 4-12).

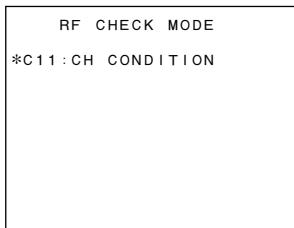


Title	Page	Description
C00 : INPUT CHECK	—	Check menu of sensors (not including a part of sensors)
C000 : CASSETTE SW	4-13	Checks the cassette tab sensors.
C001 : CASSETTE COMP. SW	4-14	Checks the cassette-in and cassette size sensors.
C002 : TOP-END SENSOR	4-15	Checks the tape top and tape end sensors.
C003 : DEW SENSOR	4-16	Checks the dew condensation sensors.
C01 : MOTOR CHECK	—	Check menu of motors (except a fan motor) and partial sensors
C010 : S REEL MOTOR	4-17	Checks the S reel motor.
C011 : T REEL MOTOR	4-17	Checks the T reel motor.
C012 : THREADING MOTOR	4-18	Checks the threading motor and threading/unthreading end sensors.
C013 : CASSETTE COMP.	4-20	Checks the cassette compartment motor and cassette-down sensors.
C014 : CAPSTAN MOTOR	4-22	Automatically checks the capstan motor.
C015 : DRUM MOTOR	4-23	Automatically checks the drum motor.
C016 : REEL SHIFT MOTOR	4-24	Checks the reel shift motor and reel position sensors.
C02 : PLUNGER SOL. CHECK	—	Check menu of solenoids
C020 : PINCH ROLLER	4-25	Checks the pinch roller solenoid.
C021 : S REEL BRAKE	4-26	Checks the S reel brake solenoid.
C022 : T REEL BRAKE	4-26	Checks the T reel brake solenoid.
C023 : CLEANING ROLLER	4-27	Checks the cleaning roller solenoid.
C03 : REEL/CAPSTAN MOTOR & FG CHECK	4-28	Continuous check menu of reel and capstan motors

---

## C1 : RF CHECK

This submode is used to check the RF system.  
For more details, refer to Section 4-2-3 (on page 4-29).



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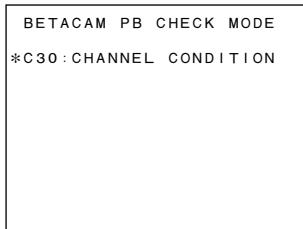
Title	Page	Description
C11 : CH CONDITION	4-29	Checks the error condition for each PB head (A2, A6, B2, and B6) in a drum.

---

---

## C3 : BETACAM PB CHECK

This submode is used to check the PB system based on a Betacam/Betacam SP format.  
For more details, refer to Section 4-2-4 (on page 4-34).



---

Title	Page	Description
C30 : CHANNEL CONDITION	4-34	Checks the RF condition for each video channel (Y and C) to be played back.

---

---

## C4 : OTHERS CHECK

This submode is used for other checks.

For more details, refer to Section 4-2-5 (on page 4-36).

OTHERS CHECK MODE
*C40:ROM VERSION
C41:SERIAL NUMBER
C42:RS-232C STATUS
C45:MEMORY CHECK
C46:HOUR METER RESET
C47:METER HEAD ROOM
C48:PATH MODE SEL

Title	Page	Description
C40 : ROM VERSION	4-36	Displays the unit's model name and ROM version.
C41 : SERIAL NUMBER	4-36	Displays and corrects the serial number of this unit.
C42 : RS-232C STATUS	4-37	Displays the interface communication state of an RS-232C connector.
C45 : MEMORY CHECK	4-38	Displays the data in ROM. (Used for check at the factory.)
C46 : HOUR METER RESET	4-38	Displays and resets the resettable hours meter and thread counter.
C48 : PATH MODE SEL	4-39	Sets the tape PB mode. (Used for tape transport adjustment.)

## A0 : SERVO ADJUST

This submode is used to adjust the servo system.

For more details, refer to Section 4-2-6 (on page 4-40).



Title	Page	Description
A000 : A001-A008 ADJ.	4-41	Continuously executes the automatic adjustment menus (A001 to A008).
A001 : S REEL FG DUTY	4-42	Automatically adjusts the duty ratio of an S reel FG.
A002 : T REEL FG DUTY	4-42	Automatically adjusts the duty ratio of a T reel FG.
A003 : CAPSTAN FG DUTY	4-42	Automatically adjusts the duty ratio of a capstan FG.
A004 : S REEL OFFSET/FRIC	4-42	Automatically adjusts the S reel offset and friction.
A005 : T REEL OFFSET/FRIC	4-42	Automatically adjusts the T reel offset and friction.
A006 : S REEL TORQUE	4-42	Automatically adjusts the S reel torque.
A007 : T REEL TORQUE	4-42	Automatically adjusts the T reel torque.
A008 : S/T TENSION OFFSET	4-42	Automatically adjusts the tension regulator offset values on the S and T sides.
A010 : CAPSTAN FREE SPEED	4-43	Automatically adjusts the capstan free speed.
A011 : RF SWITCHING POS.	4-44	Automatically adjusts the RF switching position.
A012 : NV-RAM CONTROL	4-46	Saves the adjustment data in a servo system.

---

## A1 : RF ADJUST

This submode is used to adjust the RF system.

For more details, refer to Section 4-2-7 (on page 4-47).

RF ADJUST MODE
*A11 : EQUALIZER
A13 : PLAY PLL
A14 : FWD PLL
A15 : REV PLL
A16 : A/D GAIN
A17 : A11-A16 ALL ADJUST
A1F : NV-RAM CONTROL

Title	Page	Description
A11 : EQUALIZER	4-47	Automatically adjusts the PB head playing back level and PB equalizer (for A2, A6, B2, and B6 channels).
A13 : PLAY PLL	4-47	Automatically adjusts the PB PLL circuit (in the PLAY mode).
A14 : FWD PLL	4-47	Automatically adjusts the PB PLL circuit (in the FORWARD mode).
A15 : REV PLL	4-47	Automatically adjusts the PB PLL circuit (in the REVERSE mode).
A16 : A/D GAIN	4-47	Automatically adjusts the gain when a PB RF signal is converted from analog to digital.
A17 : A11-A16 ALL ADJUST	4-51	Continuously executes the above automatic adjustment menus A11 to A16.
A1F : NV-RAM CONTROL	4-53	Saves the adjustment data in an RF system.

---

## A2 : AUDIO/VIDEO ADJUST

This submode is used to adjust the audio and video systems.

For more details, refer to Section 4-2-8 (on page 4-54).

AUDIO/VIDEO ADJUST MODE
*A20 : VPR VR
A2F : NV-RAM CONTROL

Title	Page	Description
A20 : VPR VR	4-55	Adjusts the reference signal system and analog video output system on the VPR-17 board.
A2F : NV-RAM CONTROL	4-56	Saves the adjustment data in audio and video systems.

---

### A3 : BETACAM PB ADJUST

This submode is used to adjust the PB system based on a Betacam/Betacam SP format.  
For more details, refer to Section 4-2-9 (on page 4-57).

BETACAM PB ADJUST MODE		
*A30 : EQ VR		
A32 : DM VR 1		
A33 : DM VR 2		
A34 : DM VR 3		
A35 : DM VR 4		
A36 : DM VR 5		
A37 : TBC VR		
A3F : NV-RAM CONTROL		

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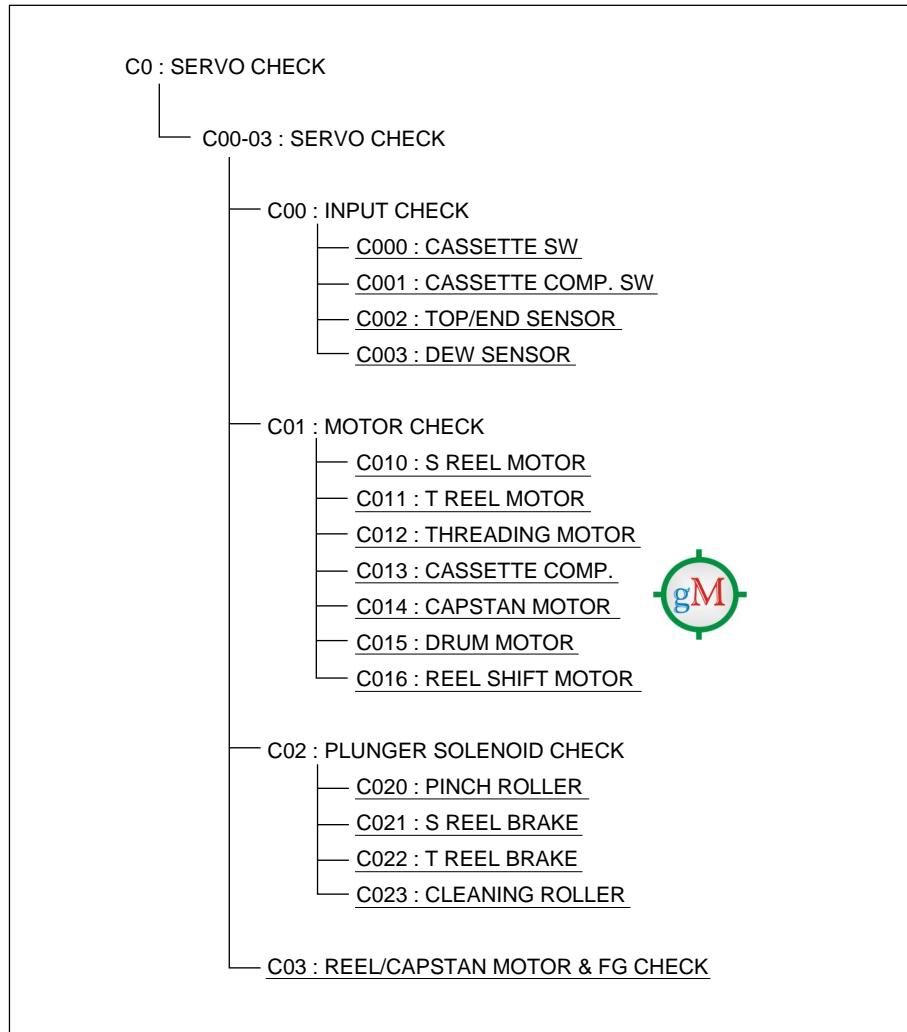
Title	Page	Description
A30 : EQ VR	4-57	Adjusts the gain of an analog Betacam PB RF amplifier (EQ-56 board).
A32 : DM VR 1	4-57	Adjusts the frequency characteristics of a primary cosine equalizer (DM-89 board).
A33 : DM VR 2	4-58	Adjusts the frequency characteristics of a secondary cosine equalizer (main) (DM-89 board).
A34 : DM VR 3	4-58	Adjusts the frequency characteristics of a secondary cosine equalizer (sub) (DM-89 board).
A35 : DM VR 4	4-58	Adjusts the guard band width and sets the DC offset level of an over-modulation compensation circuit.
A36 : DM VR 5	4-58	Adjusts the threshold level of a dropout and sets the threshold level of an RF envelope.
A37 : TBC VR	4-58	Sets the read clock timing on the TBC-23 board and the data of a PB VISC phase detection circuit.
A3F : NV-RAM CONTROL	4-59	Saves the adjustment data in an analog Betacam PB system.

## 4-2-2. SERVO CHECK Mode (C0)

The C0 : SERVO CHECK mode is used to check the servo system. The underlined menus and submenus in the menu tree below are described next.

### Note

In the servo check mode, only the menu number is displayed in a time data display area. (C00-03 is displayed as “C00”.)



Menu Tree of Servo System Check Mode

### Note

A cassette tape is automatically ejected if it has been inserted into this unit when the C00-03 : SERVO CHECK screen is shifted to the lower-level menu.

## C000 : CASSETTE SW

This submenu checks the functions of cassette tab sensors.

- (1) Press each sensor (switch) with fingers.
  - Confirm that “0” below the corresponding switch number changes to “1”.
- (2) Release the fingers.
  - Confirm that “1” below the corresponding switch number returns to “0”.
- (3) Push the MENU button when terminating the check.

### In case of NG

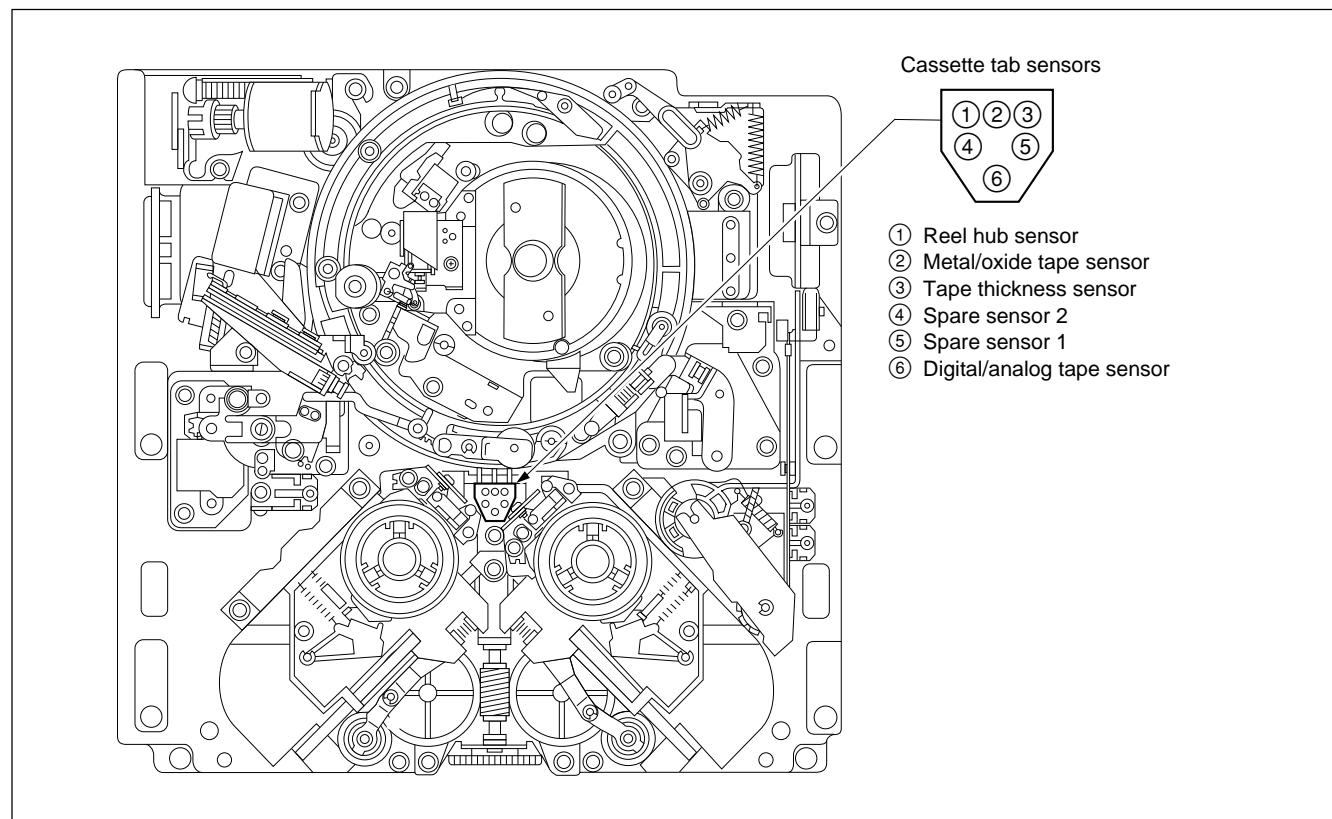
When cassette tab sensors (① to ⑥) are NG

- Check the corresponding sensor on the PTC-59 board.
- Check the sensor input port of CPU (IC1 on the MS-50 board).

SERVO CHECK INPUT CHECK	
C000 : CASSETTE SW	
1 : REEL HUB	2 : METAL/OX
3 : THICKNESS	4 : SPARE
5 : SPARE	6 : DGTL/ANLG
7 : N. A.	8 : N. A.
9 : N. A.	
SW 987654321	1 2 3
000000000	4 5
	6

(Ex.: When pushing the switch ⑥)

SERVO CHECK INPUT CHECK	
C000 : CASSETTE SW	
1 : REEL HUB	2 : METAL/OX
3 : THICKNESS	4 : SPARE
5 : SPARE	6 : DGTL/ANLG
7 : N. A.	8 : N. A.
9 : N. A.	
SW 987654321	1 2 3
000100000	4 5
	6



## C001 : CASSETTE COMP. SW

This submenu checks the sensor (switch) function of a compartment.

- (1) Push up the cassette door to the inside with fingers.
  - (2) Push each sensor (switch) in the direction indicated by the arrow with fingers.
    - Confirm that the corresponding switch number changes to “□”.
- Then release the fingers.
- Confirm that “□” returns to the former switch number.

- (3) Push the MENU button when terminating the check.

### In case of NG

- Check the corresponding sensor on the PC-70 board.
- Check the sensor input port of CPU (IC1 on the MS-50 board).

SERVO CHECK
INPUT CHECK
C001: CASSETTE COMP. SW
SW1: CASSETTE IN SW 1
SW2: CASSETTE IN SW 2
SW3: LARGE CASSETTE SW

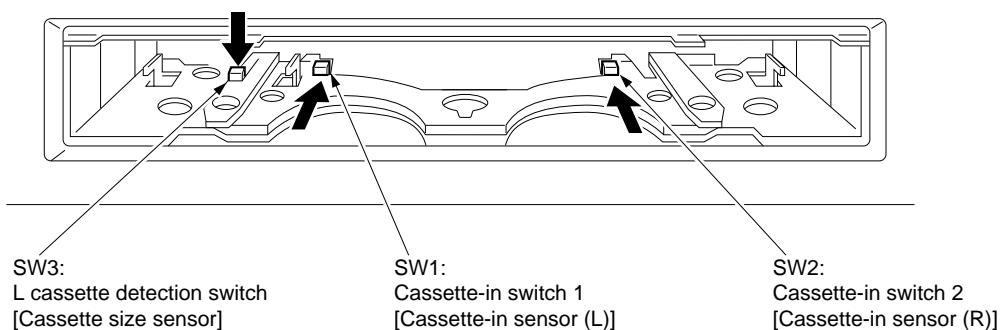
3 1 2

(Ex.)

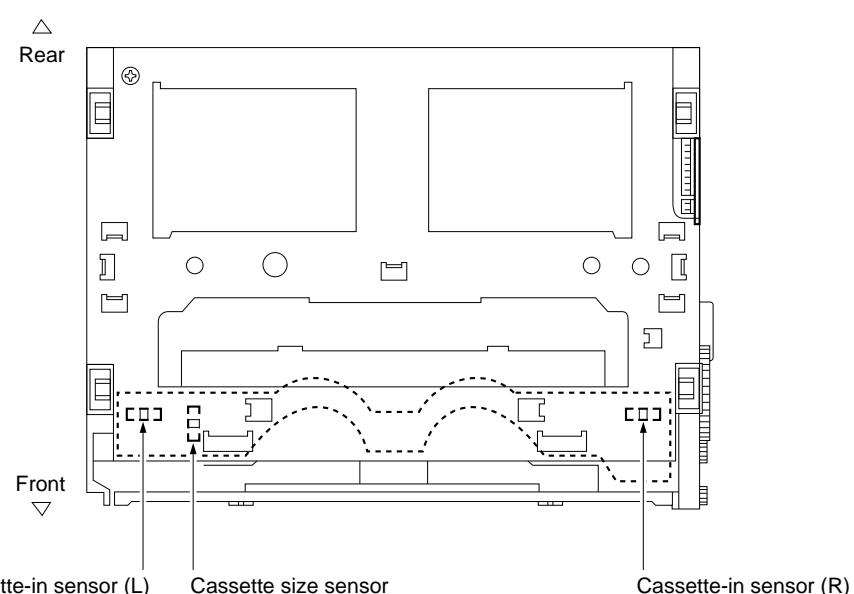
SERVO CHECK
INPUT CHECK
C001: CASSETTE COMP. SW
SW1: CASSETTE IN SW 1
SW2: CASSETTE IN SW 2
SW3: LARGE CASSETTE SW

3 □ 2

Push the cassette window up manually. Press the switch in the direction of thick arrow.



Locations of Switches in Compartment Block



Top View of Cassette Compartment

## C002 : TOP/END SENSOR

This submenu checks the functions of a tape top sensor and tape end sensor.

- (1) Bring a metallic screwdriver near each sensor.

- Confirm that the characters below the corresponding sensor change from “OFF” to “ON!”.

**CAUTION**

Never bring the screwdriver into contact with each sensor.

- (2) Keep the screwdriver away from each sensor.

- Confirm that the characters below the corresponding sensor return from “ON!” to “OFF”.

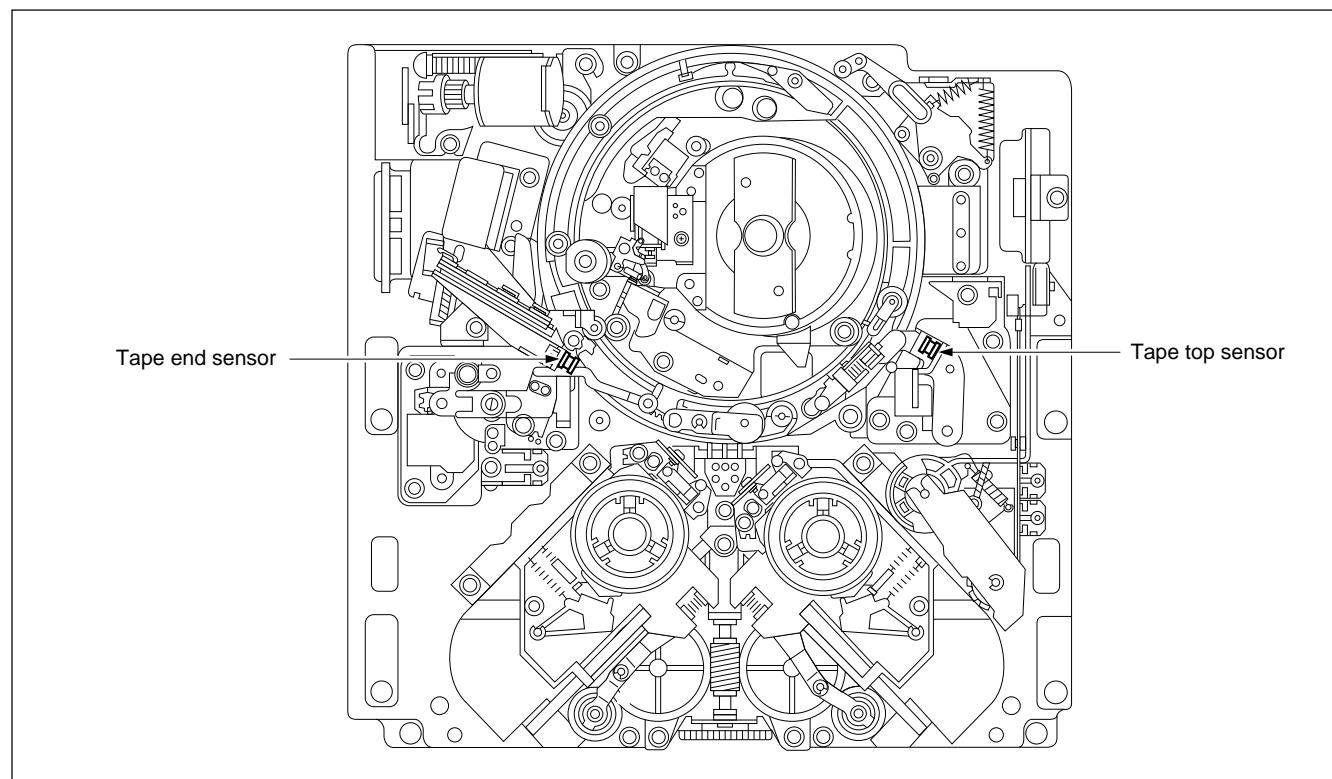
- (3) Push the MENU button when terminating the check.

**In case of NG**

- Check each sensor itself.
- Check the oscillator and detection circuit (on the MS-50 board) for sensors.
- Check the sensor input port of CPU (IC115 on the SS-63 board).

SERVO CHECK INPUT CHECK	
C002 : TOP/END SENSOR	
END SENSOR	TOP SENSOR
OFF	OFF

(Ex.)	
SERVO CHECK INPUT CHECK	
C002 : TOP/END SENSOR	
END SENSOR	TOP SENSOR
OFF	ON!



Locations of Tape Top and Tape End Sensors

### C003 : DEW SENSOR

This submenu checks the function of a dew condensation sensor.

- (1) Touch the sensor slightly with the cotton swab moistened with water.
  - Confirm that the “DRY” characters change to “WET!”.
- (2) Wipe the sensor with a dry cotton swab to eliminate the moisture or evaporate moisture completely using a blower.
  - Confirm that the “WET!” characters return to “DRY”.
- (3) Push the MENU button when terminating the check.

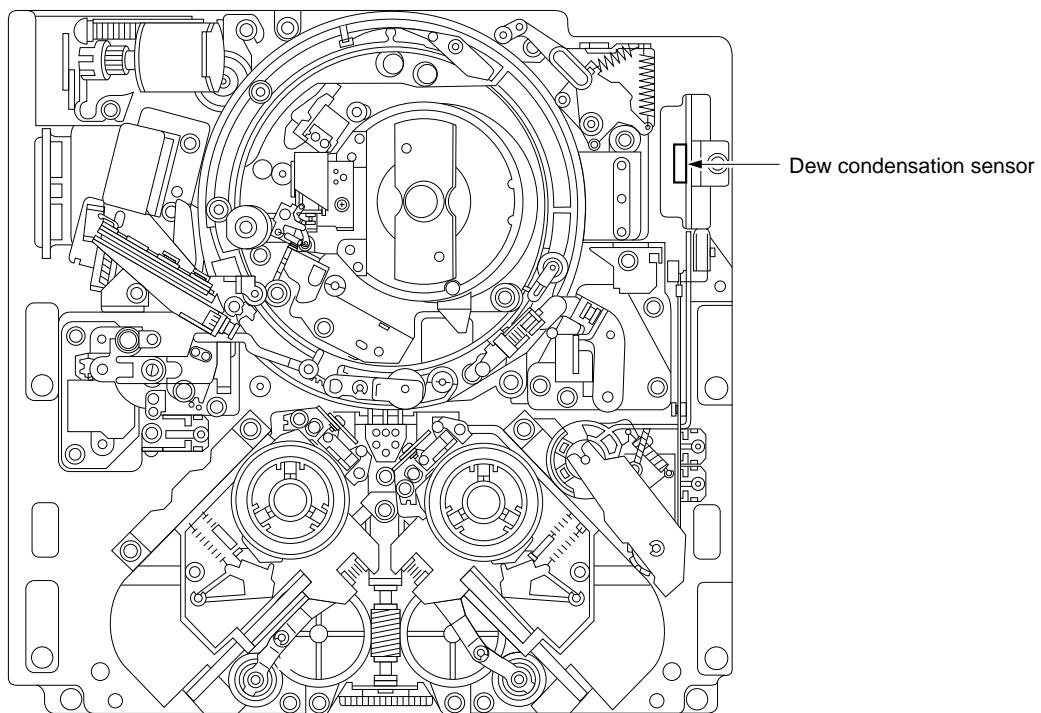
SERVO CHECK  
INPUT CHECK  
C003:DEW SENSOR  
  
DEW SENSOR : DRY

↓ moisten      dry up ↑

SERVO CHECK  
INPUT CHECK  
C003:DEW SENSOR  
  
DEW SENSOR : WET!

#### In case of NG

- Check the sensor itself.
- Check the detection circuit (on the MS-50 board).
- Check the sensor input port of CPU (IC1 on the MS-50 board).



Location of Dew Condensation Sensor

**C010 : S REEL MOTOR****C011 : T REEL MOTOR**

These menus check the function of an S reel motor or T reel motor.

- (1) Turn the search dial (JOG mode) in FORWARD (◎) or REVERSE (◎) direction.

Confirm that the reel table rotates in the specified direction at a fixed speed (about one turn per second) after the reel brake is released.

Search dial	Rotation direction of reel table
FORWARD (◎)	Clockwise (◎)
REVERSE (◎)	Counterclockwise (◎)

- (2) Stop the rotation of the search dial and confirm that the reel table stops and that the reel brake operates.

- (3) Push the MENU button when terminating the check.

SERVO CHECK  
MOTOR CHECK  
C010 : S REEL MOTOR

TURN JOG DIAL  
IN JOG MODE

SERVO CHECK  
MOTOR CHECK  
C011 : T REEL MOTOR

TURN JOG DIAL  
IN JOG MODE

**In case of NG**

When the reel table operation is defective

- Check the reel motor drive circuit (on the DR-315 board).
- Check the reel motor.

When the reel table is not constant at a rotation speed

- Adjust the duty ratio of an S/T reel FG. (A001/A002)
- Check the FG output from a reel table FG sensor (DME on the SE-344 board).
- Check the reel FG shaping circuit (on the MS-50 board).

When the brake solenoid operation is defective

- Check the S/T brake solenoid. (C021/C022)

FG sensor for S reel table FG sensor for T reel table

S reel table

T reel table

(S cassette position)

Locations of Reel Table FG Sensors

## C012 : THREADING MOTOR

This menu checks the functions of a threading motor and threading end sensor/unthreading end sensor.

- (1) Turn the search dial (JOG mode) slowly in FORWARD (◎) direction.
- Confirm that the threading motor rotates and that the threading ring rotates counterclockwise (◎) and stops in the threading end state.
  - Confirm that the superimpose picture display changes as described below.  
UNTHREAD END ⇒ ..... ⇒ THREAD END

### Note

The threading motor also stops when the rotation of the search dial stops.

- (2) Turn the search dial (JOG mode) slowly in REVERSE (◎) direction.
- Confirm that the threading motor rotates and that the threading ring rotates clockwise (◎) and stops in the unthreading end state.
  - Confirm that the superimpose picture display changes as described below.  
THREAD END ⇒ ..... ⇒ UNTHREAD END

### Note

The threading motor also stops when the rotation of the search dial stops.

- (3) To terminate the check, return to the unthreading end state and push the MENU button.

### Note

Message "SET UNTHREAD END TO RETURN" is displayed if the threading ring is not in the unthreading end state when the MENU button is pushed.

### In case of NG

When the threading ring (threading motor) operation is defective

- Confirm that no mechanical abnormality exists.
- Check the threading motor drive circuit (on the DR-315 board).
- Check the threading motor.

When the superimpose picture does not display the threading end state or unthreading end state even if the threading ring is in the threading end state or unthreading end state

- Check the threading end sensor and unthreading end sensor (on the TR-79 board).
- Check the sensor input port of CPU (IC1 on the MS-50 board).

SERVO CHECK  
MOTOR CHECK  
C012: THREADING MOTOR

\*\*\* UNTHREAD END \*\*\*

TURN JOG DIAL  
IN JOG MODE  
FWD: THREAD, REV: UNTH



SERVO CHECK  
MOTOR CHECK  
C012: THREADING MOTOR

.....

TURN JOG DIAL  
IN JOG MODE  
FWD: THREAD, REV: UNTH



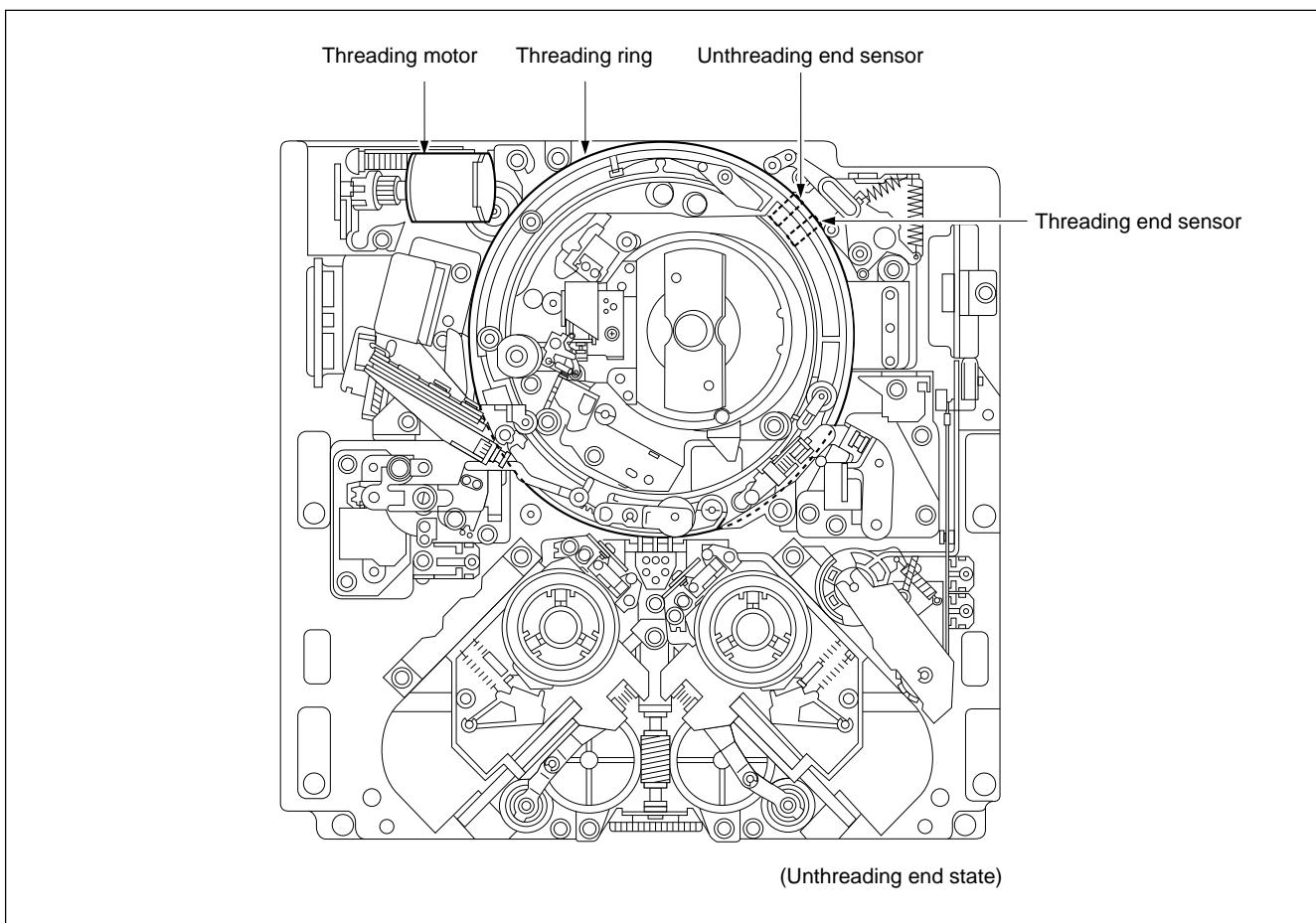
SERVO CHECK  
MOTOR CHECK  
C012: THREADING MOTOR

\*\*\* THREAD END \*\*\*

TURN JOG DIAL  
IN JOG MODE  
FWD: THREAD, REV: UNTH

SERVO CHECK  
MOTOR CHECK  
C012: THREADING MOTOR

\*\*\* THREAD END \*\*\*  
# SET UNTHREAD END #  
# TO RETURN #  
TURN JOG DIAL  
IN JOG MODE  
FWD: THREAD, REV: UNTH



## C013 : CASSETTE COMP.

This menu checks the functions of a cassette compartment motor and cassette-down sensor.

### CAUTION

Be careful not to execute this menu with the foreign matter put into the cassette compartment.

Remove it when a cassette tape is located in the cassette insertion slot. The cassette is caught halfway when this menu is executed in this state.

### Note

- “HORIZ.” or “VERT.” is displayed when this menu is selected in the state where the cassette compartment has stopped halfway due to abnormality.
- The power supply to the motor stops to protect the motor and movable part when the driving time of a motor continuously exceeds about six seconds due to abnormality.

(1) Push the SET button when “UP” is displayed.

- Confirm that the compartment goes down.
- Confirm that the screen display of the video monitor changes as described below.

UP  $\Rightarrow$  HORIZ.  $\Rightarrow$  VERT.  $\Rightarrow$  DOWN

(2) Push the SET button when “DOWN” is displayed.

- Confirm that the compartment goes up.
- Confirm that the screen display of the video monitor changes as described below.

DOWN  $\Rightarrow$  VERT.  $\Rightarrow$  HORIZ.  $\Rightarrow$  UP

(3) Push the MENU button when terminating the check.

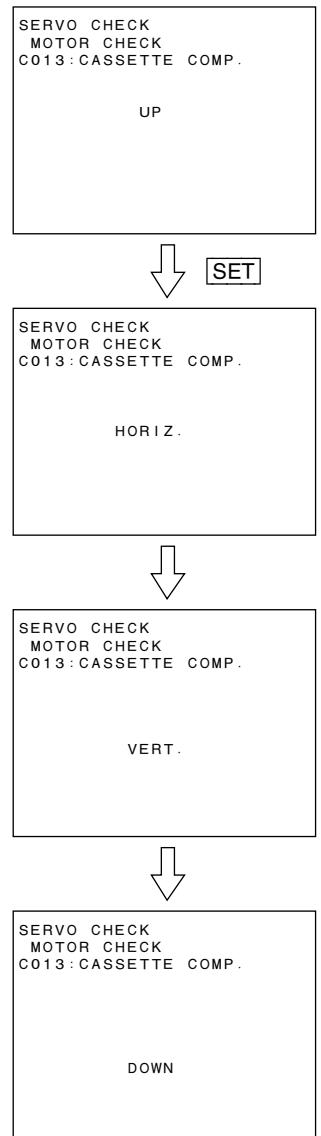
### In case of NG

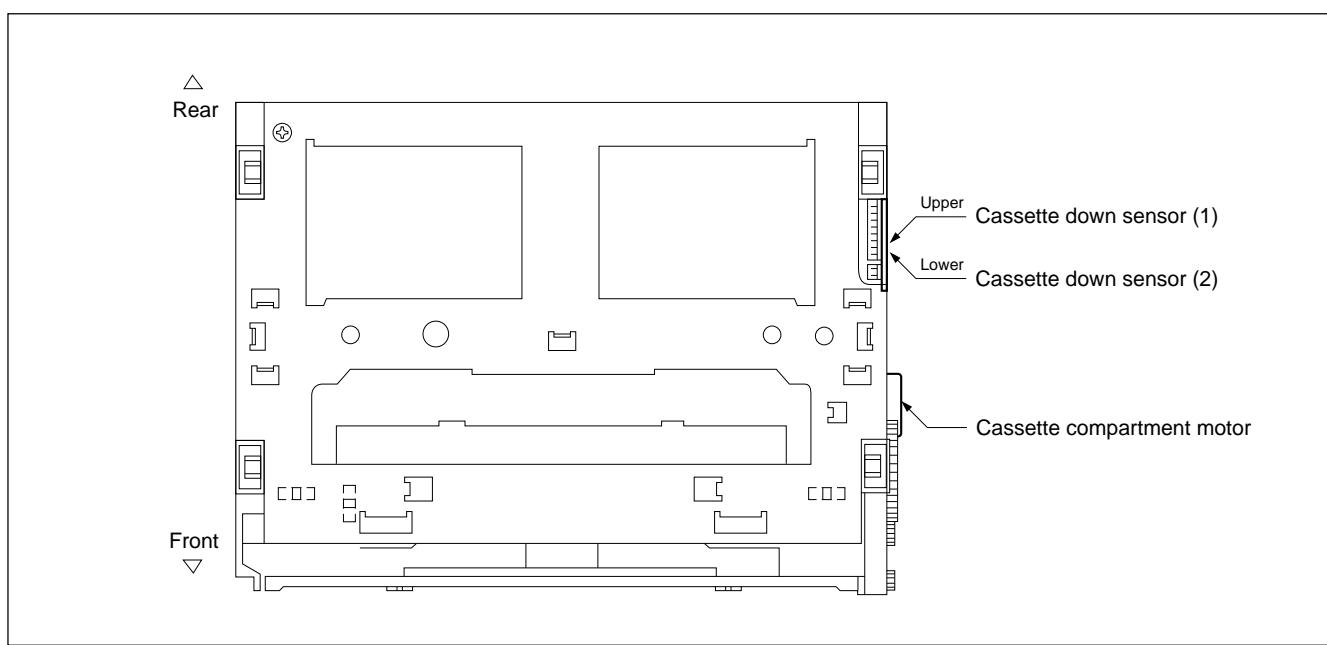
When the compartment operation is defective

- Confirm that no mechanical abnormality exists.
- Check the motor drive circuit of the cassette compartment (on the DR-315 board).
- Check the cassette compartment motor.

When the actual compartment position does not coincide with the display on the superimpose picture

- Check the cassette-down sensor (on the CL-29 board).
- Check the sensor input port of CPU (IC1 on the MS-50 board).





Top View of Cassette Compartment

## C014 : CAPSTAN MOTOR

This menu checks the function of a capstan motor.

(1) Push the SET button.

- Confirm that the capstan shaft rotates in the forward (Ω) direction.
- Confirm that message “FORWARD....OK” is displayed on the superimpose picture and that the capstan shaft stops.

(2) Push the SET button again.

- Confirm that the capstan shaft rotates in the reverse (Ω) direction.
- Confirm that message “REVERSE....OK” is displayed on the superimpose picture and that the capstan shaft stops.

(3) Push the MENU button when terminating the check.

### In case of NG

- Confirm that no mechanical abnormality exists.
- Check the capstan motor drive circuit (on the DR-315 board).
- Check the FG output from a capstan motor.
- Check the capstan FG shaping circuit (on the MS-50 board).
- Check each circuit that processes the capstan FG on the SS-63 board.
- Check the capstan motor.



SERVO CHECK  
MOTOR CHECK  
C014 : CAPSTAN MOTOR



SERVO CHECK  
MOTOR CHECK  
C014 : CAPSTAN MOTOR

FORWARD . . .

After about 10 sec.

SERVO CHECK  
MOTOR CHECK  
C014 : CAPSTAN MOTOR

FORWARD . . . OK

Capstan shaft

(Unthreading end state)

Location of Capstan Shaft

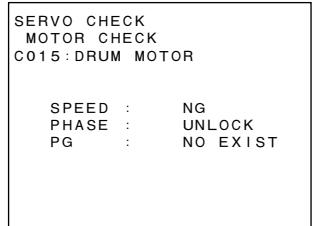
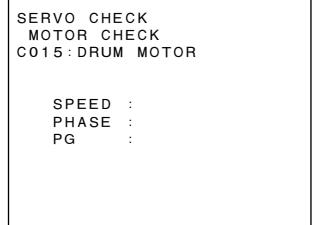
## C015 : DRUM MOTOR

This menu checks the function of a drum motor.

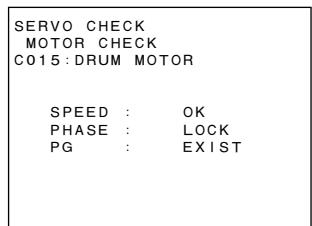
- (1) Push the SET button.
  - Confirm that the drum rotates.
  - Confirm that the superimpose picture display changes as shown on the right.
  
- (2) Push the MENU button when terminating the check.
  - Confirm that the drum stops.

### In case of NG

- Confirm that no mechanical abnormality exists.
- Check the drum motor drive circuit (on the DR-315 board).
- Check the FG and PG outputs from a drum motor.
- Check the drum FG/PG shaping circuit (on the DR-315 board).
- Check each circuit that processes the drum FG/PG on the SS-63 board.



After about 3 sec.



## C016 : REEL SHIFT MOTOR

This menu checks the functions of a reel shift motor and reel position sensor.

### Note

The power supply to the motor stops to protect the motor and movable part when the driving time of a motor continuously exceeds about six seconds due to abnormality.

(1) Push the SET button when S-POSITION is displayed.

- Confirm that the reel shift motor rotates and that the reel table moves from the S position (S cassette position) to the L position (L cassette position).
- Confirm that the superimpose picture display changes as described below.  
S-POSITION  $\Rightarrow \dots \dots \dots \Rightarrow$  L-POSITION

(2) Push the SET button when L-POSITION is displayed.

- Confirm that the reel shift motor rotates and that the reel table moves from L position (L cassette position) to the S position (S cassette position).
- Confirm that the superimpose picture display changes as described below.  
L-POSITION  $\Rightarrow \dots \dots \dots \Rightarrow$  S-POSITION

(3) Push the MENU button when terminating the check.

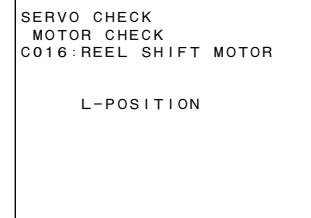
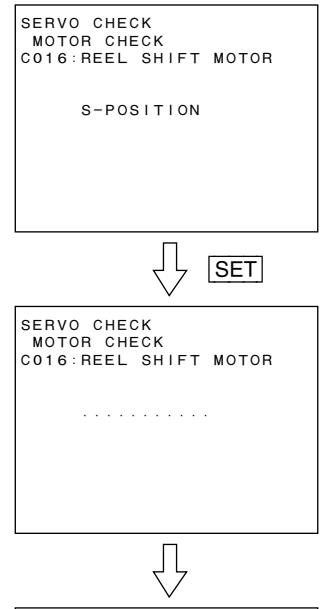
### In case of NG

When the reel table (reel shift motor) operation is defective

- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the reel shift motor (on the DR-315 board).
- Check the reel shift motor.

When the superimpose picture does not display the S or L position state even if the reel table is in the S position (S cassette position) or L position (L cassette position)

- Check the S and L position sensors (on the PTC-71 board).
- Check the sensor input port of CPU (IC1 on the MS-50 board).



Locations of S and L Position Sensors and Reel Shift Motor

## C020 : PINCH ROLLER

This menu checks the function of a pinch roller solenoid.

- (1) Push the SET button.
  - Confirm that the pinch lever comes near a capstan and makes sound when the pinch roller solenoid is turned on.
- (2) Push the MENU button.
  - The drive voltage of the pinch roller solenoid is turned off and the check menu is terminated.
- (3) Push the pinch lever slightly toward the pinch roller solenoid with fingers.

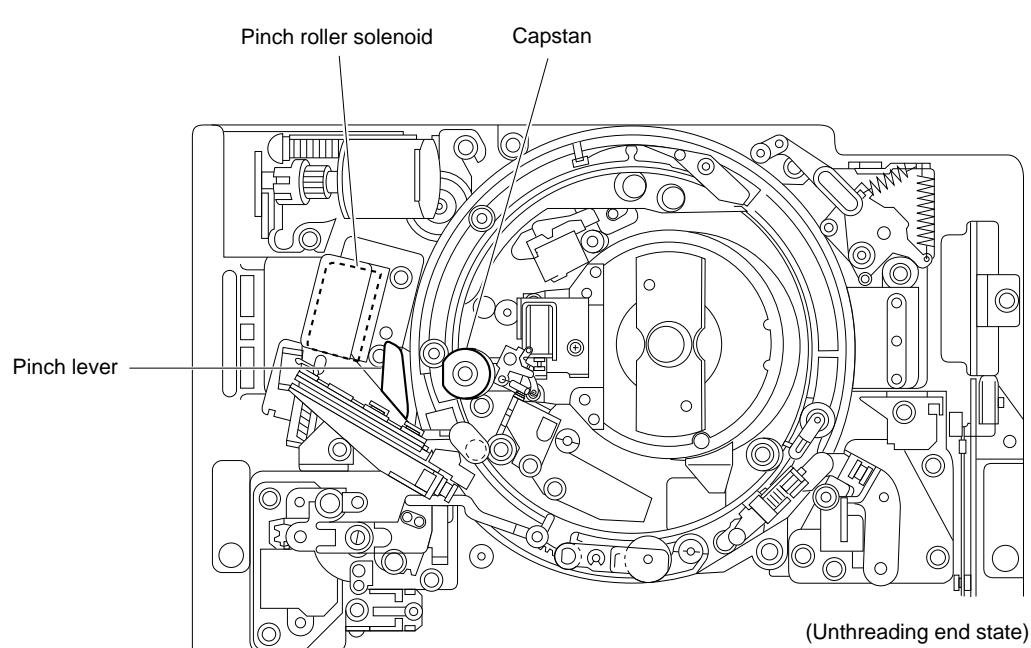
SERVO CHECK  
PLUNGER SOLENOID  
C020 : PINCH ROLLER

**Note**

The sound when the pinch roller solenoid is turned on is not generated even if the SET button is pushed in this menu with the iron core is not returned to the former position.

### In case of NG

- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the pinch roller solenoid (on the DR-315 board).
- Check the pinch roller solenoid itself.



Locations of Pinch Roller Solenoid and Pinch Lever

### C021 : S REEL BRAKE

### C022 : T REEL BRAKE

These menus check the function of an S or T reel brake solenoid.

(1) Push the SET button.

- Confirm with sound that the reel brake solenoid is turned on. (The reel table can be lightly turned with hand because the brake is in the OFF state.)

(2) Push the MENU button.

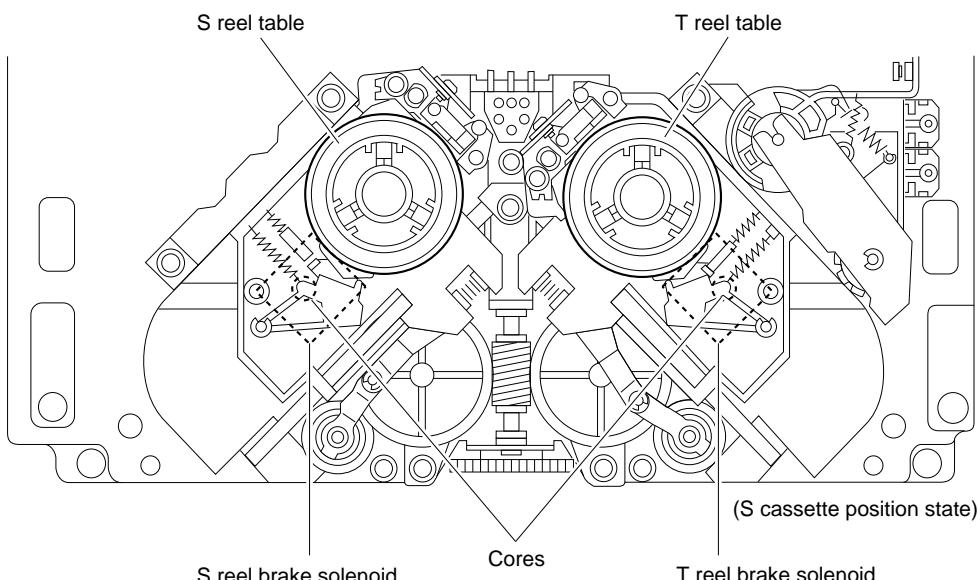
- The check menu is terminated.
- Confirm by the brakes applied to the reel table that the reel brake solenoid was turned off.

#### In case of NG

- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the reel brake solenoid (on the DR-315 board).
- Check the reel brake solenoid itself.

SERVO CHECK  
PLUNGER SOLENOID  
C021 : S REEL BRAKE

SERVO CHECK  
PLUNGER SOLENOID  
C022 : T REEL BRAKE



Locations of Reel Brake Solenoids

**C023 : CLEANING ROLLER**

This menu checks the function of a cleaning roller solenoid.

- (1) Push the SET button.

- Confirm that the cleaning roller solenoid operates and that the cleaning roller momentarily touches the drum and is immediately released from it.

SERVO CHECK  
PLUNGER SOLENOID  
C023 : CLEANING ROLLER

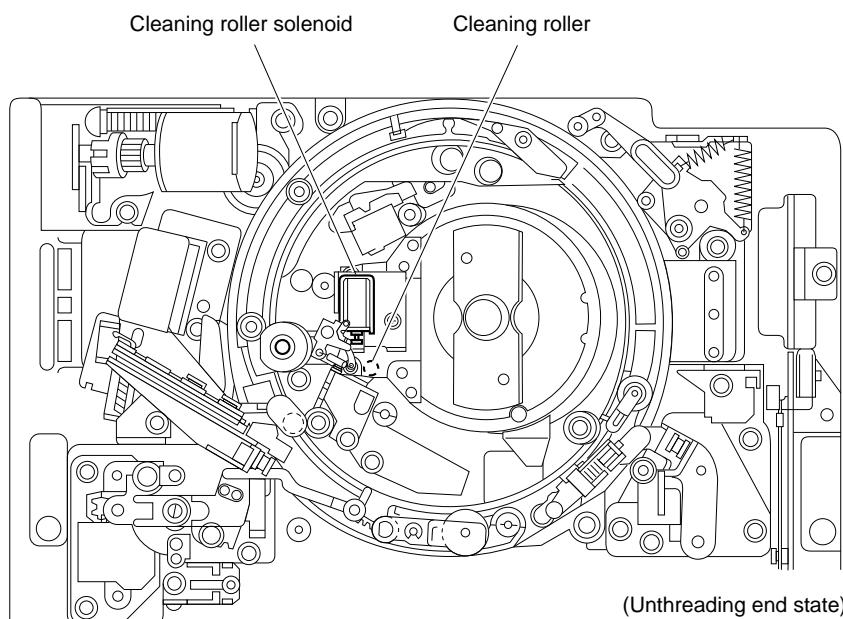
**CAUTION**

The cleaning roller solenoid causes burning when it remains on. If the cleaning roller is not away from the drum, turn off the power immediately.

- (2) Push the MENU button when terminating the check.

**In case of NG**

- Confirm that no mechanical abnormality exists.
- Check the drive circuit of the cleaning roller solenoid (on the DR-315 board).
- Check the cleaning roller solenoid itself.



**Locations of Cleaning Roller and Cleaning Roller Solenoid**

## C03 : REEL/CAPSTAN MOTOR & FG CHECK

This menu checks the following items automatically and continuously.

- S reel FG duty ratio (C031 : S REEL FG/MOTOR CHECK)
- T reel FG duty ratio (C032 : T REEL FG/MOTOR CHECK)
- Capstan FG duty ratio (C033 : CAPSTAN FG/MOTOR CHECK)
- S reel offset/friction level (C034 : S REEL OFFSET/FRICTION)
- T reel offset/friction level (C035 : T REEL OFFSET/FRICTION)
- S reel motor torque (C036 : S REEL MOTOR TORQUE)
- T reel motor torque (C037 : T REEL MOTOR TORQUE)

(1) Select C03 in the servo check mode and push the SET button to start the check.  
The item name to be checked is displayed on the superimpose picture, and the menu number (C031 to C037) is displayed in a time data display area.

(2) Confirm that all checks are completed and that message “CHECK COMPLETE” is displayed.

If message “# CHECK INCOMPLETE #” is displayed halfway, refer to the NG cases during check below.

(3) Push the MENU button to return to the selection of the servo check mode.

### For NG during (C031) S REEL FG/MOTOR CHECK

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel FG duty adjustment (A001).

### For NG during (C032) T REEL FG/MOTOR CHECK

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel FG duty adjustment (A002).

### For NG during (C033) CAPSTAN FG/MOTOR CHECK

Perform the capstan motor check (C014). If no abnormality is found in the motor or its drive circuit, perform the capstan FG duty adjustment (A003).

### For NG during (C034) S REEL OFFSET/FRICTION

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel offset/friction adjustment (A004).

### For NG during (C035) T REEL OFFSET/FRICTION

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel offset/friction adjustment (A005).

### For NG during (C036) S REEL MOTOR TORQUE

Perform the S reel motor check (C010). If no abnormality is found in the motor or its drive circuit, perform the S reel torque adjustment (A006).

### For NG during (C037) T REEL MOTOR TORQUE

Perform the T reel motor check (C011). If no abnormality is found in the motor or its drive circuit, perform the T reel torque adjustment (A007).

SERVO CHECK  
\*C00: INPUT CHECK  
C01: MOTOR CHECK  
C02: PLUNGER SOL. CHECK  
C03: REEL/CAPSTAN MOTOR & FG CHECK



SET

SERVO CHECK  
REEL/CAPSTAN MOTOR & FG CHECK  
S REEL FG/MOTOR CHECK  
CHECKING...



After about 100 sec.

SERVO CHECK  
REEL/CAPSTAN MOTOR & FG CHECK  
CHECK COMPLETE



MENU

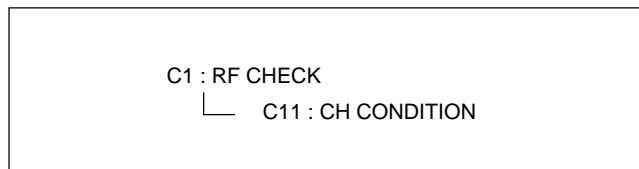
SERVO CHECK  
\*C00: INPUT CHECK  
C01: MOTOR CHECK  
C02: PLUNGER SOL. CHECK  
C03: REEL/CAPSTAN MOTOR & FG CHECK

(Ex. of NG)

SERVO CHECK  
REEL/CAPSTAN MOTOR & FG CHECK  
S REEL FG/MOTOR CHECK  
# CHECK INCOMPLETE #

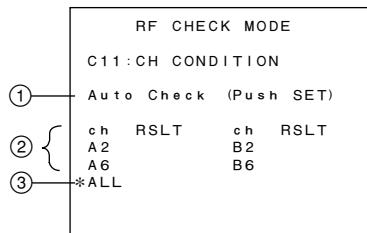
### 4-2-3. RF CHECK Mode (C1)

The C1 : RF CHECK mode is used to check the PB RF system based on an Betacam SX format.  
In this unit, one menu is available.



Menu Tree of RF System Check Mode

#### C11 : CH CONDITION



In this menu, the error condition for each channel is displayed in three steps (GRN, YEL, and RED) when the tape recorded based on a Betacam SX format is played back by tracking.

- C11 checks using the PB signal from the PB heads in A2, A6, B2, and B6 channels.

#### Notes

- During normal operation, the tape is played back by non-tracking. Therefore, the condition for each channel cannot be confirmed using a CH CONDITION indicator.
- If abnormality exists in the servo system, each menu of C1 : RF CHECK does not function normally.

#### Description of superimpose picture

- ① The display in this line changes. Each display and its meaning are described below.

Auto Check (Push SET) : Push the SET button to start the check.

Insert SR5-1 : Insert an alignment tape.

Auto Tracking... : Tracking is in an optimization process.

Auto Checking... : Check is in progress.

Auto Check Complete : Check is completed.

Auto Check Failure : Check failure

Condition NG : Error condition defect

- ② Select using a \* mark when checking the condition for each channel.

After the check is completed, the condition (GRN, YEL, or RED) is displayed on the right of a channel name. “RED” is displayed even if the check fails.

#### Note

“RSLT” indicates the result.

- ③ Select ALL when checking the condition for all channels.

During check, the condition in each channel is displayed in area ②.

After the check for all channels is completed, “GRN” is also displayed on the right of ALL if the condition for all channels is GRN. If there is at least one channel whose condition is YEL or RED, the worst condition is displayed on the right of ALL.

## To execute the check

- (1) Insert the cassette tape recorded by a Betacam SX format.

### Notes

- The tape amount on the recorded portion that is played back after a cassette tape is inserted must exceed the check execution time.  
The check execution time for each channel is usually about ten seconds and about 40 seconds in an ALL check.
- Usually, use alignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system).

- (2) Turn the search dial and move the \* mark to the channel to be checked or ALL.

- Usually, select ALL.

- (3) Push the SET button.

- The tape is automatically played back in the PLAY mode. The check is then initiated.
- Message “Auto Tracking ...” or “Auto Checking ...” is displayed on the superimpose picture.

During ALL check execution, the check result in the channel is displayed every time a one-channel check is completed.

The time data display area displays an ordinary time counter.

- To cancel the check, push the MENU button.

### Notes

- Message “Insert SR5-1” is displayed on the superimpose picture when no cassette tape is inserted. The tape is automatically played back in the PLAY mode when a cassette tape is inserted. The check is then initiated.
- If message “Auto Check (Push SET)” is continuously displayed on the superimpose picture, the non-recorded portion on the tape is judged to be played back from the beginning. Change the playback position on the tape.
- Check cannot be properly performed in modes other than PLAY mode. Leave the check as it is until automatic check is completed. If modes other than PLAY mode are entered, the check cannot be performed any longer or the condition becomes “RED”.

- (4) Confirm the check result on the superimpose picture.

- If no abnormality is found, “GRN” is displayed on the right of the selected channel or ALL.
- Refer to the “For Check Failure” on page 4-33 when message “Auto Check Failure” is displayed on the superimpose picture.
- Refer to the “For Condition NG” on page 4-32 when message “Condition NG” is displayed on the superimpose picture or when conditions other than “GRN” are displayed on the right of the checked channel.

### Notes

- Refer to the “For Check Failure” on page 4-33 when the check result in all channels is “RED” even if message “Condition NG” is displayed on the superimpose picture during ALL check execution.
- “GRN”, “YEL”, or “RED” is displayed in a time data display area. In only the time data display area, it cannot be confirmed whether the condition is NG or check failure when it is “RED”.

The check result for each channel is displayed when the search dial is turned after performing ALL check.

- (5) Push the MENU button when terminating the menu.

To execute the check again in this menu, return to step (2).

### Note

To change the playback tape, push the SET button while pressing the EJECT button. The tape is then ejected without influencing the check result. Insert another tape and push the PLAY button. The check is then initiated. This operation does not coincide with the message on the superimpose picture.

### Example of display and operation

**ALL is selected in C11 : CH CONDITION**

Superimpose picture

```
RF CHECK MODE
C11:CH CONDITION
Auto Check (Push SET)
ch   RSLT      ch   RSLT
A2       B2
A6       B6
*ALL
```

Time data display area

C11-ALL

(continued)

```
RF CHECK MODE
C11:CH CONDITION.
Auto Check Complete
ch   RSLT      ch   RSLT
A2   GRN       B2   GRN
A6   GRN       B6   GRN
*ALL GRN
```

- (1) ↓ Insert SR5-1/SR5-1P
- (2) ↓ Select
- (3) ↓ **SET**

- (4) ↓ Confirm
- (5) ↓ **[MENU]**

```
RF CHECK MODE
C11:CH CONDITION
Auto Tracking ...
ch   RSLT      ch   RSLT
A2       B2
A6       B6
*ALL
```



```
RF CHECK MODE
C11:CH CONDITION
Auto Checking ...
ch   RSLT      ch   RSLT
A2       B2
A6       B6
*ALL
```



```
RF CHECK MODE
C11:CH CONDITION
Auto Check Complete
ch   RSLT      ch   RSLT
A2   GRN       B2
A6       B6
*ALL
```



```
RF CHECK MODE
C11:CH CONDITION
Auto Tracking ...
ch   RSLT      ch   RSLT
A2   GRN       B2
A6       B6
*ALL
```

↓  
(omitted)

↓  
(continue)

## For Condition NG

Confirm, recheck, and clean the drum (video heads) according to the procedures below.

- (1) If a check is performed using alignment tapes other than SR5-1/SR5-1P, recheck using alignment tape SR5-1/SR5-1P.

If no abnormality is found, the check is completed.

**Note**

If no abnormality is found during check using an alignment tape, a trouble (tape is damaged or recording is not done properly) is considered to exist in the previously played back tape.

- (2) Change the playback portion on the alignment tape, then recheck.

If no abnormality is found, the recheck is completed.

- (3) Recheck using an alignment tape after performing the cleaning using a cleaning tape (in Section 5-2-1).

If no abnormality is found, the recheck is completed.

- (4) Recheck using an alignment tape after performing the cleaning using a cleaning tape again (the amount of the tape used is 15 seconds).

If no abnormality is found, the recheck is completed.

- (5) Recheck using an alignment tape after performing the cleaning with cleaning cloth (in Sections 5-2-2 and 5-2-3).

If no abnormality is found, the recheck is completed.

If the error condition is not improved in the way mentioned above, the possible cause below are considered.

- Servo system adjustment defect or circuit defect
  - ⇒ Readjust the servo system. (A0 : SERVO ADJUST)
  - ⇒ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- RF system adjustment defect
  - ⇒ Readjust the RF system. (A1 : RF ADJUST)
- Worn PB head in the drum assembly
  - ⇒ After confirming the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required.  
(Refer to the maintenance manual part 2, volume-1.)
- Adjustment defect in tape transport system or component part installation defect.
  - ⇒ Readjust the tape transport system or reinstall the parts  
(Refer to the maintenance manual part 2, volume-1.)
- EQ-56 board defect
  - Drum assembly defect



---

## For Check Failure

Change the playback portion on the tape, then recheck.  
If no check failure occurs again, a trouble is considered to exist in the previously played back portion.

### Confirmation of cassette tape

Check failure occurs if the no-recorded portion is played back or the recording format is not in Betacam SX.  
Moreover, check failure will also occur on the tape recorded by the failed Betacam SX VTR. Confirm that the tape can be correctly played back by the VTR based on other normal operating Betacam SX VTR .

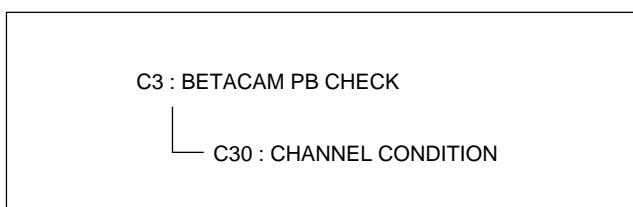
### If no trouble is found on the played back tape

The possible cause below are considered.

- Heads clogging
  - ⇒ Perform steps (1) to (5) of “For Condition NG” on previous page.
- Servo system adjustment defect or circuit defect
  - ⇒ Readjust the servo system. (A0 : SERVO ADJUST)
  - ⇒ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
- Brush/slip ring assembly defect or its part installation/connection defect
  - ⇒ Replace or reinstall the brush/slip ring assembly.  
(Refer to the maintenance manual part 2, volume-1.)
- Harness (between EQ-56 board and drum assembly) connection defect
- RF system adjustment defect
  - ⇒ Readjust the RF system. (A1 : RF ADJUST)
- EQ-56 board defect
- Drum assembly defect

The C3 : BETACAM PB CHECK mode is used to check the playback RF system based on a Betacam/Betacam SP format.

In this unit, one menu is available.



Menu Tree of BETACAM PB Check Mode

#### Note

Betacam/Betacam SP PB function of DNW-A22 is for NTSC (525/60) system only.

Betacam/Betacam SP PB function of DNW-A22P is for PAL (625/50) system only.

#### C30 : CHANNEL CONDITION

This menu displays the RF condition of video channels (Y and C) in three steps (GRN, YEL, and RED) when the tape recorded based on a Betacam/Betacam SP format is played back in the PLAY mode.

#### Note

If abnormality exists in the servo system, the C30 : CHANNEL CONDITION menu does not function normally.

#### To execute the check

(1) Push the SET button.

- A white square is displayed in the upper-right position of the superimpose picture.  
The time data display area displays an ordinary time counter.
  - To cancel the check, push the MENU button.
- (2) Insert the cassette tape recorded based on a Betacam/Betacam SP format.
- (3) Push the PLAY button. (Playing back the tape in the PLAY mode.)
- “>>>” is displayed on the superimpose picture.

#### Note

No check can be performed in modes other than PLAY. “>>>” is not displayed even if the portion recorded based on formats other than Betacam/Betacam SP or the non-recorded portion is played back in the PLAY mode.

(4) Confirm that “>>>” is displayed in the “GRN” column of Y and C channels.

- If “>>>” is displayed in columns other than “GRN”, refer to the “For Condition NG” on the next page.

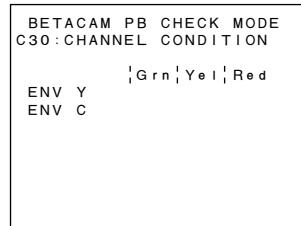
#### To terminate the check

(5) Stop the tape playback operation and eject the cassette.

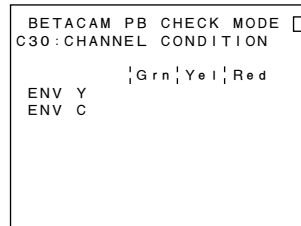
(6) Push the MENU button.

- The square displayed in the upper-right position of the superimpose picture disappears.  
The time data display area displays the former “C30-CHANNEL COND”.

#### Example of display and operation

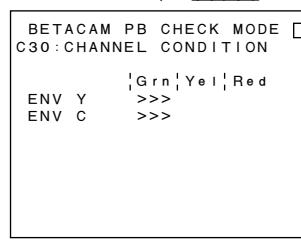


(1) ↓ [SET]



(2) ↓ Insert a recorded tape

(3) ↓ [PLAY]



(4) ↓ Confirm

(5) ↓ [STOP]

↓ [EJECT]

(6) ↓ [MENU]

---

## For Condition NG

Confirm, recheck, and perform the drum (video heads) cleaning according to the procedures below.

- (1) Change the tape playback portion, then recheck.  
If no abnormality is found, the recheck is completed.
- (2) Perform the cleaning using a cleaning tape (in Section 5-2-1) (the amount of the tape used is five seconds), then recheck.  
If no abnormality is found, the recheck is completed.
- (3) Perform the cleaning using a cleaning tape again (the amount of the tape used is 15 seconds), then recheck.  
If no abnormality is found, the recheck is completed.
- (4) Perform the cleaning with cleaning cloth (in Sections 5-2-2 and 5-2-3), then recheck.  
If no abnormality is found, the recheck is completed.  
If the condition described above is not improved, the abnormality below is considered to have occurred.

### Abnormality on PB tape

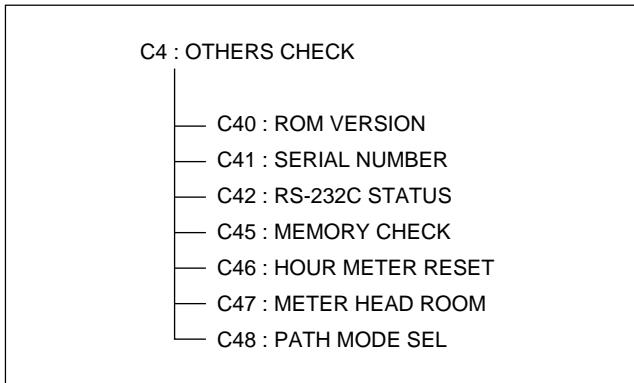
- The tape is damaged.
- The tape cannot be recorded properly.

### Abnormality in this unit

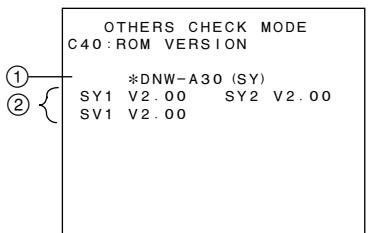
- Adjustment defect of Betacam PB system  
⇒ Readjust the Betacam PB system. (A3 : BETACAM PB ADJUST)  
(Perform the adjustment corresponding to “6-4. DM-89 Board Replacement”.)
- Adjustment defect in tape transport system or component part installation defect.  
⇒ Readjust the tape transport system or reinstall the parts.  
(Refer to the maintenance manual part 2, volume-1.)
- Worn PB head  
⇒ After confirming the hours meter (H2 : DRUM RUNNING HOURS), replace the upper drum assembly as required.  
(Refer to the maintenance manual part 2, volume-1.)
- Drum assembly defect
- EQ-56 board defect

## 4-2-5. OTHERS CHECK Mode (C4)

The C4 : OTHERS CHECK mode has seven menus.



### C40 : ROM VERSION



**Note**

The display on the left is one of the displayed examples.

This menu displays the model name of this unit, the destination, and the ROM version.

#### Description of superimpose picture

- ① The model name of this unit and the destination in parentheses are displayed on the superimpose picture. The model name and destination are detected from the setting condition of the DIP switch (S1102) on the SS-63 board.
- ② Each version number of system control ROMs (SY1 and SY2), and a servo ROM (SV1) is displayed on the superimpose picture.

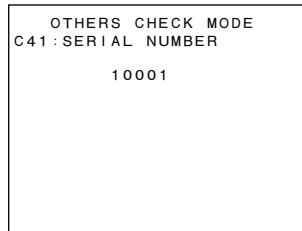
#### Menu operation

Turn the search dial to move the \* mark.

The contents of a \*-marked item on the superimpose picture are displayed in a time data display area.

The installed option is displayed on only the superimpose picture.

### C41 : SERIAL NUMBER



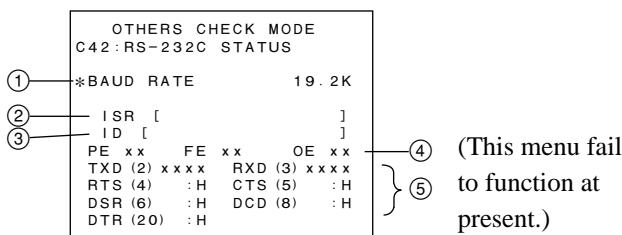
This menu displays the serial number of this unit. When each serial number does not coincide because of repair, it can be set again in this menu.

**Notes**

- Set the serial number again after the SS-63 board or the NV-RAM (IC710 on the SS-63 board) is replaced.
- “-----” is displayed in the state where no serial number is set.

#### Serial number setting

- (1) Turn the search dial to turn on and off the digit you wish to set.
- (2) Turn the search dial while pressing the JOG button and change the digit number.
  - Message “Push SET Button” is displayed on only the superimpose picture when the serial number is changed.
  - To cancel the setting, push the MENU button to terminate this menu.
- (3) Repeat steps (1) and (2) for each digit.
- (4) Push the SET button to save the set serial number.
  - Message “Saving...” is displayed on only the superimpose picture. If no abnormality is found, the display changes to “Save Complete” after a few seconds.

**C42 : RS-232C STATUS**

This menu displays the communication state of an RS-232C interface. The communication baud rate can also be changed in this menu.

**Note**

Only the information of the communication baud rate is displayed in a time data display area.

**Description of superimpose picture**

- ① The communication baud rate is displayed on the superimpose picture. The baud rate can be selected from among the followings. (The factory setting is 19.2 K.)  
1200, 2400, 4800, 9600, 19.2K (bps)

**Note**

In a time data display area, 19.2K is displayed as "19 2K".

- ② The status of an ISR protocol is displayed on the superimpose picture.

ISR x [y y y y . . . . .]  
  (a)   (b)

- (a) Displays the protocol status of this unit.

A: ACK send  
N: NAK send  
T: ATN (OPC or QRESP) send  
W: ACK wait  
X: XOFF receive, XON wait

- (b) Displays the last ISR command that was received properly. (The preceding command is displayed until ACK transmission is completed.)

If no object for communication is connected to the RS-232C connector, items (a) and (b) become blank.

- ③ The device ID is displayed on the superimpose picture. The device ID is set using the DEVICE command of an ISR protocol. This setting is maintained (even if the power is turned off) until it is changed by the DEVICE command. The device ID becomes blank when it is not set.

- ④ The number of errors below that occur during reception is displayed on the superimpose picture.

PE: Parity error

FE: Framing error

OE: Overrun error

If no object for communication is connected to the RS-232C connector, each error is not displayed as a time count, but as "xx".

- ⑤ The TXD/RXD signal displays the number of data items (number of bytes) properly sent and received in this unit in four digits (hexadecimal).

Other signals display the connection state of an RS-232C connector in a high level (+3 V or more, or non-connection) and low level (-3 V or less).

If no object for communication is connected to the RS-232C connector, TXD and RXD are displayed as "xxxx".

**Setting of communication baud rate**

- (1) Turn the search dial while pressing the JOG button and display the desired baud rate.
- Message "Push SET Button" is displayed on only the superimpose picture when the setting is changed.
  - To cancel the setting, push the MENU button to terminate this menu.
- (2) Push the SET button to save the setting.
- Message "Saving ..." is displayed on only the superimpose picture. If no abnormality is found, the display changes to "Save Complete" after a few seconds.
- To turn off "Save Complete", turn the search dial.

**Note**

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pushed except during communication baud rate setting. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).

However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.

To return to the former state, push the MENU button.

## C45 : MEMORY CHECK

OTHERS CHECK MODE C45:MEMORY CHECK	
0000*0000:	E8 FF BD 27
0000 0004:	14 00 BF AF
0000 0008:	10 80 03 3C
0000 000C:	10 00 63 24
0000 0010:	F8 FF 60 AC
0000 0014:	F4 FF 60 AC
0000 0018:	FC FF 60 AC
0000 001C:	1F 80 0D 3C
0000 0020:	00 FF AD 35

This menu displays the ROM data installed in this unit in hexadecimal.

### Note

This menu is used for inspection at the factory.

### Menu operation

Turn the search dial to move the \* mark upward or downward. The address and data display portions are then scrolled.

Turn the search dial while pressing the JOG button: The address then changes 100H at a time.

Turn the search dial while pressing the VAR button: The address then changes 10000H at a time.

Turn the search dial while pressing the JOG and VAR buttons: The address then changes 1000000H at a time.

The contents of the \*-marked line on the superimpose picture are displayed in a time data display area.

### Note

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pushed. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).

However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.

To return to the former state, push the MENU button.

## C46 : HOUR METER RESET

OTHERS CHECK MODE C46:HOUR METER RESET	
*DRUM HOURS	1234
TAPE HOURS	123
THREAD COUNTER	2345
AIR FILTER HRS	1593

This menu can display and reset the values of the resettable hours meter and thread counter.

### Description of superimpose picture

DRUM HOURS: Indicates the total of drum rotation time. Same as in setup menu ITEM-H12.

TAPE HOURS: Indicates the total of tape transport time. Same as in setup menu ITEM-H13.

THREAD COUNTERS: Indicates the total of threading count. Same as in setup menu ITEM-H14.

AIR FILTER HRS: Indicates the total of air filter time used. Same as in setup menu ITEM-H15.

### Menu operation

Turn the search dial to move the \* mark.

The contents of the \*-marked line on the superimpose picture are displayed in a time data display area.

### To reset

The former state cannot be returned when the SET button is pushed for reset operation.

- (1) Turn the search dial and move the \* mark to the item to be reset.
- (2) Turn the search dial in REVERSE (Q) direction while pressing the JOG button. = The display value then becomes zero ("0").
  - Message "Push SET Button" is displayed on only the superimpose picture when the display value is set to "0".
  - To return to the former state, turn the search dial in FORWARD (Q) direction.
- (3) If there are other items to be reset, repeat steps (1) and (2).
- (4) Push the SET button to save the reset data.
  - Message "Saving ..." is displayed on only the superimpose picture. If no abnormality is found, the display changes to "Save Complete" after a few seconds.

To turn off "Save Complete", turn the search dial.

## C48 : PATH MODE SEL

OTHERS CHECK MODE  
C48:PATH MODE SEL  
\*Switching PB

This menu sets the PB mode for confirming and adjusting video tracking. Switching PB and full PB modes are available for setting.

A PB signal is output to the test point (TP106) on the SS-63 board by the REC head when the tape is played back with this menu opened. (The signal output from this test point becomes an envelope waveform.)

In the switching PB mode, only the data area (helical track) based on an SX format is played back.

In the full PB mode, the overlap portion before and behind the data area based on an SX format is played back.

The switching PB mode is always set when the menu is opened.

### PB mode setting

To set the PB mode, turn the search dial while pressing the JOG button and display the desired setting.

### Menu operation

A white square is displayed in the upper-right position of the superimpose picture when the SET button is pushed after the switching PB and full PB modes are set. The unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed.)

In this state, play back the specified alignment tape, and confirm and adjust the video tracking.

However, character information (time code or operation status) superimposed during ordinary operation is not displayed.

To return to the former state, push the MENU button.

### Note

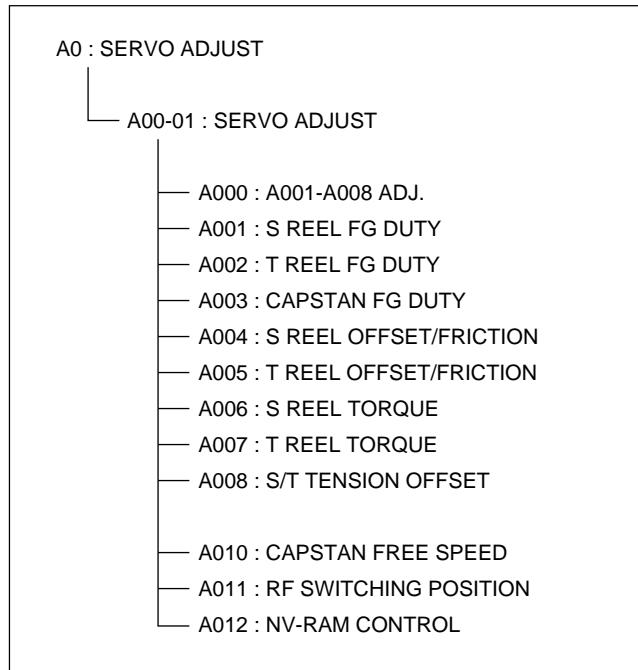
For the video tracking confirmation and adjustment, refer to “7-1-3. Video Tracking Confirmation and Adjustment” in the maintenance manual part 2, volume-1.

## 4-2-6. SERVO ADJUST Mode (A0)

The A0 : SERVO ADJUST mode is used to adjust the servo system.

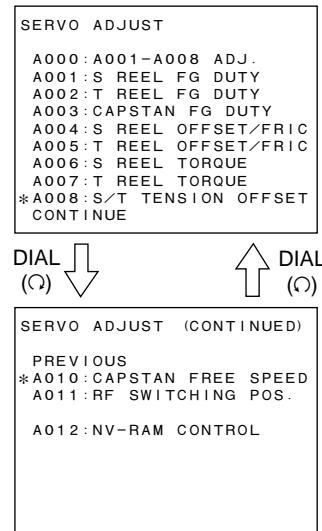
### Note

In the SERVO ADJUST mode, only the menu number is displayed in a time data display area. (A00-01 is displayed as A00.)



### A00-01 : SERVO ADJUST

In the A00-01 : SERVO ADJUST menu, the whole menu cannot be displayed on the superimpose picture at a time. Therefore, the display is divided into the menu selection screen of A000 to A008 and the menu selection screen of A010 and later. The menu selection screen is automatically switched when the search dial is turned.



### Note

The cassette tape is automatically ejected when the A00-01 : SERVO ADJUST menu is shifted to the lower-level menu with the cassette tape inserted into this unit.

## A000 : A001-A008 ADJ.

This menu is used to execute the adjustment menus below automatically and continuously.

A001 : S REEL FG DUTY  
 A002 : T REEL FG DUTY  
 A003 : CAPSTAN FG DUTY  
 A004 : S REEL OFFSET/FRICTION  
 A005 : T REEL OFFSET/FRICTION  
 A006 : S REEL TORQUE  
 A007 : T REEL TORQUE  
 A008 : S/T TENSION OFFSET

### To execute the adjustment menus

(1) Push the SET button.

- The automatic adjustment is initiated when the SET button is pushed.  
The execution time is about 150 seconds.
- The adjustment menu name in execution and message “ADJUSTING.....” are displayed on the superimpose picture during automatic adjustment. Only the menu number is displayed in a time data display area.
- Message “ADJUST COMPLETE” is momentarily displayed on the superimpose picture when each adjustment menu is completed normally.  
Message “# ADJUST INCOMPLETE #” is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 4-45 when this message is displayed.
- Confirm the adjustment result.
- Message “ADJUST COMPLETE” remains displayed on the superimpose picture when all adjustments are completed normally.
- Push the MENU button to terminate the menu.
- To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A012 : NV-RAM CONTROL menu.

### Example of display and operation

#### Example of A001 : S REEL FG DUTY

Superimpose picture

SERVO ADJUST  
A001-008: AUTO ADJUST

Time data display area

A000

(1) ↓ [SET]

SERVO ADJUST  
A001-008: AUTO ADJUST

A001: S REEL FG DUTY  
ADJUSTING.....

R001



SERVO ADJUST  
A001-008: AUTO ADJUST

A002: T REEL FG DUTY  
ADJUSTING.....

R002

↓  
(omitted)  
↓

SERVO ADJUST  
A001-008: AUTO ADJUST

A008: S/T TENSION OFFSET  
ADJUSTING.....

R008



SERVO ADJUST  
A001-008: AUTO ADJUST

A008: S/T TENSION OFFSET  
ADJUST COMPLETE

R000

(2) ↓ Confirm  
(3) ↓ [MENU]  
(4) ↓ Data save

\*A012: NV-RAM CONTROL

SERVO ADJUST  
A001-008: AUTO ADJUST

A006: S REEL TORQUE

# ADJUST INCOMPLETE #  
# S REEL TROUBLE #

Ex.: When failing the automatic adjustment

- 
- A001 : S REEL FG DUTY**  
**A002 : T REEL FG DUTY**  
**A003 : CAPSTAN FG DUTY**  
**A004 : S REEL OFFSET/FRICTION**  
**A005 : T REEL OFFSET/FRICTION**  
**A006 : S REEL TORQUE**  
**A007 : T REEL TORQUE**  
**A008 : S/T TENSION OFFSET**

These menus are used to perform the automatic adjustments below.

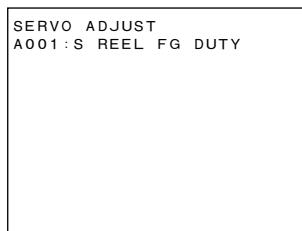
- A001 : S reel FG duty adjustment
- A002 : T reel FG duty adjustment
- A003 : Capstan FG duty adjustment
- A004 : S reel offset/friction adjustment
- A005 : T reel offset/friction adjustment
- A006 : S reel torque adjustment
- A007 : T reel torque adjustment
- A008 : S/T tension offset adjustment

#### To execute the automatic adjustments

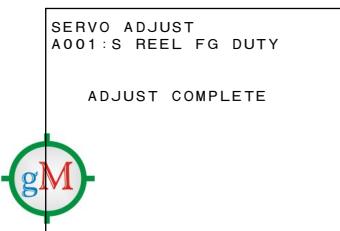
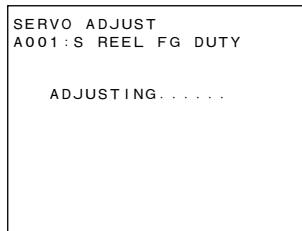
- (1) Push the SET button.
  - The automatic adjustment is initiated when the SET button is pushed.  
The execution time is about 15 seconds for A001 to A003 and about 20 seconds for others.
  - Message “ADJUSTING.....” is displayed on only the superimpose picture during automatic adjustment.
- (2) Confirm the adjustment result.
  - Message “ADJUST COMPLETE” is displayed on the superimpose picture when the automatic adjustment is completed normally.
  - Message “# ADJUST INCOMPLETE #” is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 4-45 when this message is displayed.
- (3) Push the MENU button to terminate the menu.
- (4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A012 : NV-RAM CONTROL menu.

#### Example of display and operation

##### Example of A001 : S REEL FG DUTY



(1) ↓ **SET**

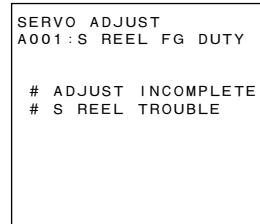


(2) ↓ Confirm

(3) ↓ **MENU**

(4) ↓ Data save

[\*A012:NV-RAM CONTROL]



**Ex.: When failing the automatic adjustment**

## A010 : CAPSTAN FREE SPEED

This menu is used to perform the automatic adjustment of a capstan free speed.

### To execute the automatic adjustment

#### Note

Message “SET SR2-1 ALIGNMENT TAPE AND PUSH PLAY KEY” is displayed on the superimpose picture when this menu is opened. However, it is not necessary to push the PLAY button.

- (1) Insert alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 625/50 system).

- The adjustment is initiated when an alignment tape is inserted.
- Message “ADJUSTING.....” is displayed on only the superimpose picture during automatic adjustment.

#### Notes

- Be sure to use the specified alignment tape. If the specified cassette tape is not used, the adjustment cannot be properly performed even if message “ADJUST COMPLETE” is displayed after it is completed.
- The tape amount on the portion that can be played back after an alignment tape is inserted must exceed the adjustment execution time.

The adjustment execution time is usually about 15 seconds.

- (2) Confirm the adjustment result.

- Message “ADJUST COMPLETE” is displayed on the superimpose picture when the automatic adjustment is completed normally.

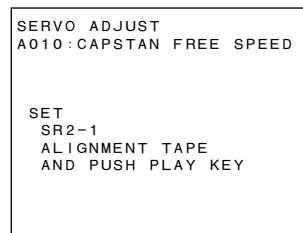
An alignment tape is ejected automatically.

- Message “# ADJUST INCOMPLETE #” is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 4-45 when this message is displayed.

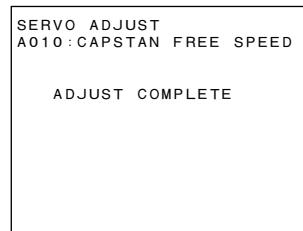
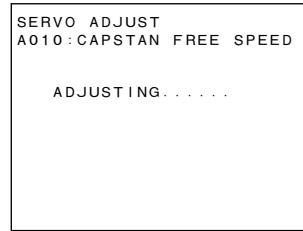
- (3) Push the MENU button to terminate the menu.

- (4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A012 : NV-RAM CONTROL menu.

### Example of display and operation



(1) ↓ Insert SR2-1/SR2-1P

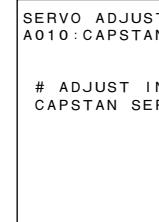


(2) ↓ Confirm

(3) ↓ [MENU]

(4) ↓ Data save

[\*A012:NV-RAM CONTROL]



**Ex.: When failing the automatic adjustment**

## A011 : RF SWITCHING POS.

This menu is used to adjust the RF switching position automatically or manually. Only the automatic adjustment is described below.

### To execute the automatic adjustment

#### Note

Alignment tapes SR2-1 (for a 525/60 system) and SR2-1P (for a 625/50 system) located in the beginning of time code 00:25:00:00 in advance is required for this adjustment. If the specified cassette tape is not used, the adjustment cannot be properly performed even if message “ADJUST COMPLETE” is displayed after it is completed.

(1) Confirm that a \* mark is assigned to the “AUTO” display on the superimpose picture and push the SET button.

- If the \* mark is assigned to the “MANUAL” display, turn the search dial and move the mark to the “AUTO” display.
- In a time data display area, the automatic adjustment (AUTO) is displayed as “A0110”, and the manual adjustment (MANUAL) is displayed as “A0111”.

(2) Insert alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 626/50 system) located in the beginning of time code 00:25:00:00.

- The adjustment is initiated when an alignment tape is inserted.
- Message “ADJUSTING.....” is displayed on only the superimpose picture during automatic adjustment.

(3) Confirm the adjustment result.

- Message “ADJUST COMPLETE” is displayed on the superimpose picture when the automatic adjustment is completed normally.  
An alignment tape is ejected automatically.
- Message “# ADJUST INCOMPLETE #” is displayed on the superimpose picture when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 4-45 when this message is displayed.

(4) Push the MENU button to terminate the menu.

(5) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A012 : NV-RAM CONTROL menu.

### Example of display and operation

Superimpose picture

```
SERVO ADJUST
A011:RF SWITCHING POS.

*AUTO
MANUAL

PG DATA:BDF5
```

(1) ↓ **SET**

```
SERVO ADJUST
A011:RF SWITCHING POS.

SET
SR2-1
ALIGNMENT TAPE
TC 00:25:00:00

PG DATA:C000
```

Time data display area

**A0110**

(2) ↓ Insert SR2-1/SR2-1P

```
SERVO ADJUST
A011:RF SWITCHING POS.

ADJUSTING.....
.

PG DATA:BFFF
```

**A011**

```
SERVO ADJUST
A011:RF SWITCHING POS.

ADJUST COMPLETE

PG DATA:BDF7
```

**A011**

(3) ↓ Confirm

(4) ↓ **MENU**

(5) ↓ Data save

\*A012:NV-RAM CONTROL

```
SERVO ADJUST
A011:RF SWITCHING POS.

# ADJUST INCOMPLETE #

PG DATA:C000
```

When failing the automatic adjustment

## For Automatic Adjustment Failure

The circuit in which failure occurred can be traced to some degree by the trouble message displayed together when message “# ADJUST INCOMPLETE #” is displayed during execution of adjustment menus A000 to A011.

### Note

The trouble message display indicates that no adjustment could be performed because the circuit described in this manual does not operate normally. Moreover, other circuits (e.g., control signal system) in which failure actually occurred may also exist.

## A000 : A000-A008 ADJUST

Refer to the description of A001 to A008.

## A001 : S REEL FG DUTY

When “S REEL FG AMP TROUBLE” is displayed

- ⇒ Check the S reel FG amplifier circuit on the MS-50 board.

When “S REEL DRIVER TROUBLE” is displayed

- ⇒ Check the S reel motor driver circuit on the DR-315 board.

## A002 : T REEL FG DUTY

When “T REEL FG AMP TROUBLE” is displayed

- ⇒ Check the T reel FG amplifier circuit on the MS-50 board.

When “T REEL DRIVER TROUBLE” is displayed

- ⇒ Check the T reel motor driver circuit on the DR-315 board.

## A003 : CAPSTAN FG DUTY

When “CAPSTAN FG AMP TROUBLE” is displayed

- ⇒ Check the capstan FG amplifier circuit on the MS-50 board.
- ⇒ Check the capstan motor driver circuit on the DR-315 board.

## A004 : S REEL OFFSET/FRICTION

## A006 : S REEL TORQUE

“# S REEL TROUBLE #” is displayed in these menus.

- ⇒ Execute the S reel FG duty adjustment (A001 : S REEL FG DUTY) again.
- ⇒ Check the S reel motor driver circuit on the DR-315 board.

## A005 : T REEL OFFSET/FRICTION

## A007 : T REEL TORQUE

“# T REEL TROUBLE #” is displayed in these menus.

- ⇒ Execute the T reel FG duty adjustment (A002 : T REEL FG DUTY) again.
- ⇒ Check the T reel motor driver circuit on the DR-315 board.

## A008 : S/T TENSION OFFSET

When “S REEL DRIVER TROUBLE” is displayed

- ⇒ Check the S tension detection circuit on the MS-50 board.
- ⇒ Check the S reel motor driver circuit on the DR-315 board.

When “T REEL DRIVER TROUBLE” is displayed

- ⇒ Check the T tension detection circuit on the MS-50 board.
- ⇒ Check the T reel motor driver circuit on the DR-315 board.

## A010 : CAPSTAN FREE SPEED

Confirm whether the played back tape is alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 625/50 system).

When “CAPSTAN SERVO TROUBLE” is displayed

- ⇒ Execute the capstan FG duty adjustment (A003 : CAPSTAN FG DUTY) again.
- ⇒ Check the capstan FG amplifier circuit and CTL amplifier circuit on the MS-50 board.

When “CAPSTAN DRIVER TROUBLE” is displayed

- ⇒ Check the capstan motor driver circuit on the DR-315 board.

## A011 : RF SWITCHING POS.

Confirm whether the played back tape is alignment tape SR2-1 (for a 525/60 system) or SR2-1P (for a 625/50 system).

## A012 : NV-RAM CONTROL

The A012 : NV-RAM CONTROL menu is used to save the servo adjustment data adjusted in the SERVO ADJUST mode in the NV-RAM of a servo system.

### CAUTION

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when “# ADJUST INCOMPLETE #” is displayed).

### Note

When adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

### To execute the data save

- (1) Turn the search dial and move the \* mark to “SAVE SERVO ADJUST DATA” on the superimpose picture.
  - In a time data display area, NO OPERATION is displayed as “A0120”, and SAVE SERVO ADJUST DATA is displayed as “A0121”.
- (2) Push the SET button.
  - The data transmission is initiated when the SET button is pushed. The data transmission time is about ten seconds.
  - Message “SAVING.....” is displayed on the superimpose picture, and “A0121 00” is displayed in the time data display area.
- (3) Confirm that the data transmission is completed.
  - After the data transmission is completed, message “DATA SAVED” is displayed on the superimpose picture and “A0121 10” is displayed in the time data display area.
- (4) Push the MENU button to terminate the menu.

### Example of display and operation

Superimpose picture

SERVO ADJUST  
A012:NV-RAM CONTROL  
\*NO OPERATION  
SAVE SERVO ADJUST DAT

Time data display area

A0120

(1) ↓ DIAL (◎)

SERVO ADJUST  
A012:NV-RAM CONTROL  
NO OPERATION  
\*SAVE SERVO ADJUST DATA

A0121

(2) ↓ SET

SERVO ADJUST  
A012:NV-RAM CONTROL  
NO OPERATION  
\*SAVE SERVO ADJUST DATA

A0121 00

SAVING.....



SERVO ADJUST  
A012:NV-RAM CONTROL  
NO OPERATION  
\*SAVE SERVO ADJUST DATA

A0121 10

DATA SAVED

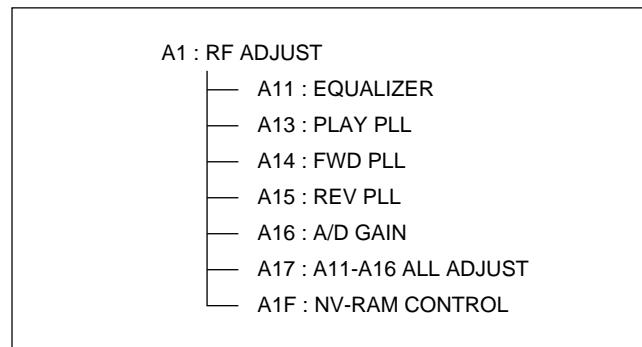
(3) ↓ Confirm

(4) ↓ MENU

## 4-2-7. RF ADJUST Mode (A1)

The A1 : RF ADJUST mode is used to adjust the RF system.

In this unit, seven menus are available.



Menu Tree of RF System Adjustment Mode

### Note

If abnormality exists in the servo system, each menu in A1 : RF ADJUST does not function normally.

#### A11 : EQUALIZER

#### A13 : PLAY PLL

#### A14 : FWD PLL

#### A15 : REV PLL

#### A16 : A/D GAIN

These menus are used to perform the automatic adjustments below.

#### A11 : EQUALIZER

This menu automatically adjusts the PB head PB levels (VC) for A2, A6, B2, and B6 channels, and the gain (EQ) and phase (PH) of a PB equalizer.

#### A13 : PLAY PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for PLAY mode.

#### A14 : FWD PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for F FWD mode.

#### A15 : REV PLL

This menu automatically adjusts the VCO free-running frequency in a PB PLL circuit for REV mode.

#### A16 : A/D GAIN

This menu automatically adjusts the gain when a PB RF signal is converted from analog to digital.

Right side display is an example of the adjustment data during the STOP button is pressed. Actually, adjustment data is displayed at the "xx" portion.

RF ADJUST MODE	
A11 : EQUALIZER	
Auto Adjust (Push SET)	
ch RSLT	ch RSLT
A2	B2
A6	B6
*ALL	

RF ADJUST MODE	
A11 : EQUALIZER	
Auto Adjust (Push SET)	
ch VC	ch PH
A2 xx	x x B2
A6 xx	x x B6
*ALL	

A11 : EQUALIZER

RF ADJUST MODE	
A13 : PLAY PLL	
Auto Adjust (Push SET)	
ch RSLT	ch RSLT
A2/6	B2/6
*ALL	

RF ADJUST MODE	
A13 : PLAY PLL	
Auto Adjust (Push SET)	
ch VR	ch VR
A2/6 xx	B2/6 xx
*ALL	

A13 : PLAY PLL

RF ADJUST MODE	
A14 : FWD PLL	
Auto Adjust (Push SET)	
ch RSLT	ch RSLT
A2/6	B2/6
*ALL	

RF ADJUST MODE	
A14 : FWD PLL	
Auto Adjust (Push SET)	
ch VR	ch VR
A2/6 xx	B2/6 xx
*ALL	

A14 : FWD PLL

RF ADJUST MODE	
A15 : REV PLL	
Auto Adjust (Push SET)	
ch RSLT	ch RSLT
A2/6	B2/6
*ALL	

RF ADJUST MODE	
A15 : REV PLL	
Auto Adjust (Push SET)	
ch VR	ch VR
A2/6 xx	B2/6 xx
*ALL	

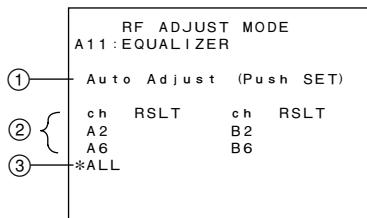
A15 : REV PLL

RF ADJUST MODE	
A16 : A/D GAIN	
Auto Adjust (Push SET)	
ch RSLT	ch RSLT
A2/6	B2/6
*ALL	

RF ADJUST MODE	
A16 : A/D GAIN	
Auto Adjust (Push SET)	
ch VR	ch VR
A2/6 xx	B2/6 xx
*ALL	

A16 : A/D GAIN

### Description of superimpose picture



Ex. A11 : EQUALIZER

- ① The display in this line changes. Each display and its meaning are described below.

Auto Adjust(Push SET) : Push the SET button to initiate the automatic adjustment.

Insert SR5-1 : Insert an alignment tape.

Auto Tracking ... : Tracking is in an optimization process.

Auto Adjusting ... : Automatic adjustment is in progress.

Auto Adjust Complete : Automatic adjustment is completed.

Auto Adjust Failure : Automatic adjustment failure Condition NG : Error condition NG

- ② To perform the automatic adjustment for each channel (circuit), select using a \* mark.

The adjustment result (OK, NG, or FAIL) is displayed on the right of the channel name. "OK" is displayed if the adjustment can be performed normally. "NG" is displayed if the error condition is bad. "FAIL" is displayed if the automatic adjustment fails.

#### Note

"RSLT" indicates the result.

The adjustment data in each channel (circuit) is displayed while the STOP button is pressed during except adjustment.

#### Note

Do not push the STOP button during adjustment. The tape stops and the adjustment becomes impossible.

- ③ To perform the automatic adjustment in all channels (circuits) at a time, select ALL.

After the automatic adjustment in all channels (circuits) is completed, "OK" is displayed on the right of ALL if all channels (circuits) are OK. If there is one channel in which NG or failure occurs, "NG" or "FAIL" is displayed on the right of ALL. If both NG and failure occur in channels, "FAIL" is displayed.

### To execute the adjustment

- (1) Insert the specified alignment tape.

#### Notes

- If the specified alignment tape is not used, the adjustment cannot be properly performed even if message "Auto Adjust Complete" is displayed after it is completed. In other menus, insert alignment tape SR5-1 (a 525/60 system) or SR5-1P (for a 625/50 system).

- Take care that the tape transport mode does not change during automatic adjustment.

Any adjustment cannot be properly performed in modes other than tape transport that was set automatically. Moreover, in modes other than tape transport, the automatic adjustment cannot be performed any longer or "FAIL" or "NG" is displayed as the adjustment result. Therefore, pay attention to the transport start position of the tape so that the end and beginning of the tape are not detected during adjustment. The minimum tape amount required for normal automatic adjustment is shown in the table below. However, the tape amount increases or decreases when abnormality occurs.

Menu	Upper: Ordinary adjustment time
	Lower: Tape amount required (Transport mode)
A11 : EQUALIZER ①	About 1 min./ALL, about 15 sec./channel Adjustment time (PLAY)
A13 : PLAY PLL	About 12 sec./ALL, about 10 sec./circuit Adjustment time (PLAY)
A14 : FWD PLL	About 10 sec. About 10 min. (F FWD)
A15 : REV PLL	About 10 sec. About 11 min. (REV)
A16 : A/D GAIN ①	About 25 sec./ALL, about 10 sec./circuit Adjustment time (PLAY)

In a menu with ①, tracking operation is performed.

- (2) Turn the search dial and move the \* mark to the channel to be adjusted or ALL.

- Usually, select ALL.

(3) Push the SET button.

- The tape runs automatically and the automatic adjustment is initiated.
- Message “Auto Tracking...” (only a menu in which tracking operation is performed) or “Adjusting...” is displayed on the superimpose picture.

**Note**

When ALL adjustment is performed in the menu in which tracking operation is carried out, the adjustment result of the channel is displayed every time one-channel (circuit) adjustment is completed.

- The time data display area displays an ordinary time counter.
- To cancel the automatic adjustment, push the MENU button.
- Message “Insert SR5-1” is displayed on the superimpose picture when no alignment tape is inserted. When an alignment tape is inserted, the tape runs automatically and the automatic adjustment is initiated.

**Notes**

- If message “Auto Adjust (Push SET)” is continuously displayed on the superimpose picture with the automatic adjustment initiated (the SET button pushed), the non-recorded portion on the tape is judged to be played back from the beginning. Change the playback position on the tape.
- Do not touch the button or search button, during automatic adjustment, that influences the tape transport.

Any adjustment cannot be properly performed when the tape transport state is changed. In this case, the automatic adjustment cannot be performed any longer or “FAIL” or “NG” is displayed as the adjustment result.

(4) Confirm the result of automatic adjustment on the superimpose picture.

- If no abnormality is found, “OK” is displayed on the right of the selected channel (circuit).
- Refer to the “For Condition NG/Automatic Adjustment Failure” on page 4-53 when “Condition NG” or “Auto Adjust Failure” is displayed on the superimpose picture.
- To confirm the adjustment data, push the STOP button.

**Note**

“OK”, “NG”, or “FAIL” is displayed in a time data display area.

The adjustment result for each channel (circuit) is displayed when the search dial is turned after ALL adjustment is completed.

(5) To terminate the menu, push the MENU button.

To execute the automatic adjustment again in this menu, return to step (2).

(6) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A1F : NV-RAM CONTROL menu.

To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A1F : NV-RAM CONTROL menu.

**Note**

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (message “Auto Adjust Failure” or “Condition NG” is displayed).

### Example of display and operation

Ex.: ALL is selected in  
A11 : EQUALIZER

```
RF ADJUST MODE
A11: EQUALIZER
Auto Adjust (Push SET)
ch RSLT ch RSLT
A2 B2
A6 B6
*ALL
```

- (1) ↓ Insert SR5-1/SR5-1P
- (2) ↓ Select
- (3) ↓ **SET**

```
RF ADJUST MODE □
A11: EQUALIZER
Auto Tracking ...
ch RSLT ch RSLT
A2 B2
A6 B6
*ALL
```



```
RF ADJUST MODE □
A11: EQUALIZER
Auto Adjusting .....
ch RSLT ch RSLT
A2 B2
A6 B6
*ALL
```



```
RF ADJUST MODE □
A11: EQUALIZER
Auto Adjust Complete
ch RSLT ch RSLT
A2 OK B2
A6 B6
*ALL
```



(omitted)



```
RF ADJUST MODE
A11: EQUALIZER
Auto Adjust Complete
ch RSLT ch RSLT
A2 OK B2 OK
A6 OK B6 OK
*ALL OK
```

- (4) ↓ Confirm
- (5) ↓  **MENU**
- (6) ↓ Data save

**[\*A1F:NV-RAM CONTROL]**

Ex.: ALL is selected in  
A13 : PLAY PLL

```
RF ADJUST MODE
A13: PLAY PLL
Auto Adjust (Push SET)
ch RSLT ch RSLT
A2/6 B2/6
*ALL
```

- (1) ↓ Insert SR5-1/SR5-1P
- (2) ↓ Select
- (3) ↓ **SET**

```
RF ADJUST MODE □
A13: PLAY PLL
Auto Adjusting
ch RSLT ch RSLT
A2/6 B2/6
*ALL
```



```
RF ADJUST MODE □
A13: PLAY PLL
Auto Adjust (Push SET)
ch RSLT ch RSLT
A2/6 OK B2/6 OK
*ALL OK
```

- (4) ↓ Confirm
- (5) ↓  **MENU**
- (6) ↓ Data save

**[\*A1F:NV-RAM CONTROL]**

## A17 : A11-A16 ALL ADJUST

This menu execute the automatic adjustment of A11 to A16 described previously in the following order.

Order No.	Menu No.
1	A13: PLAY PLL
2	A16: A/D GAIN
3	A11: EQUALIZER
4	A14: FWD PLL
5	A15: REV PLL

### To execute the automatic adjustment

- (1) Insert alignment tape SR5-1 (for a 525/60 system) or SR5-1P (for a 625/50 system) that was rewound to the beginning of the tape.

#### Note

Be sure to use the specified alignment tape.

If the specified cassette tape is not used, the adjustment cannot be performed properly.

- (2) Push the SET button.
  - The automatic adjustment is initiated when the SET button is pushed.
  - The superimpose picture during adjustment is displayed in the same way as when the adjustment is executed independently. If message "Condition NG" or "Auto Adjust Failure" is not displayed, the automatic adjustment is completed after about 4 seconds.

- (3) Confirm that message "Auto Adjust Complete" is displayed on the superimpose picture.
  - Confirm the adjustment data from each menu.

#### Note

If abnormality exists during adjustment, message "Condition NG" or "Auto Adjust Failure" is displayed on the superimpose picture in the same way as when the adjustment is executed independently. The automatic adjustment stops in the adjustment menu. Message "A17-ALL FAIL" or "A17-ALL NG" is displayed in a time data display area.

- Refer to the "For Condition NG/Automatic Adjustment Failure" on page 4-53 when message "Condition NG" or "Auto Adjust Failure" is displayed.
- To confirm the adjustment data, press the STOP button.

- (4) Push the MENU button.

- To execute readjustment, push the MENU button.  
Select again once the menu is completed.

- (5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A1F : NV-RAM CONTROL menu.

To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A1F : NV-RAM CONTROL menu.

#### Note

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when message "Auto Adjust Failure" or "Condition NG" is displayed).

### Example of display and operation

(continued)

Superimpose picture

RF ADJUST MODE  
A17:A11-A17 ALL ADJUST  
Auto Adjust (Push SET)

Time data display area

R17-PUSH SET BTN

- (1) ↓ Insert SR5-1/SR5-1P  
(2) ↓ [SET]

RF ADJUST MODE  
A17:A11-A17 ALL ADJUST  
A13:PLAY PLL  
Auto Adjusting  
  
ch RSLT ch RSLT  
A2/6 B2/6  
\*ALL

- (3) ↓ Confirm  
(4) ↓ [SET]  
(5) ↓ Data save

\*A1F:NV-RAM CONTROL

↓  
(omitted)

RF ADJUST MODE  
A17:A11-A17 ALL ADJUST  
A16:A/D GAIN  
Auto Adjusting  
  
ch RSLT ch RSLT  
A2/6 B2/6  
\*ALL



↓  
(omitted)

RF ADJUST MODE  
A17:A11-A17 ALL ADJUST  
A11:EQUALIZER  
Auto Adjusting  
  
ch RSLT ch RSLT  
A2 B2  
A6 B6  
\*ALL

↓  
(omitted)

(continue)

## For Condition NG/Automatic Adjustment Failure

Confirm in the procedure below when message “Condition NG” or “Auto Adjust Failure” is displayed during execution of adjustment menus A11 to A17.

- (1) Confirm whether the specified alignment tape is used.  
If the specified alignment tape is not used, execute the automatic adjustment by the specified one.  
SR5-1 for 525/60 system, SR5-1P for 625/50 system
- (2) Clean the drum (rotary head) referring to the “For Condition NG” in Section 4-2-3.  
This operation is not required when the drum has been already cleaned.
- (3) Perform the automatic adjustment menu A17 when message “Condition NG” or “Auto Adjust Failure” is displayed during execution of menus other than menu A17 or A13.  
If no abnormality is found, the adjustment is completed.

If the message “Condition NG” is displayed, the possible cause below are considered.

- Servo system adjustment defect or circuit defect
    - ⇒ Readjust the servo system. (A0 : SERVO ADJUST)
    - ⇒ Check the servo system. (C03 : REEL/CAPSTAN MOTOR & FG CHECK)
  - RF system adjustment defect
    - ⇒ Readjust the RF system. (A1 : RF ADJUST)
  - Worn PB head in the drum assembly
    - ⇒ After confirming the hours meter (H02 : DRUM RUNNING HOURS), replace the upper drum assembly as required. (Refer to the maintenance manual part 2, volume-1.)
  - Adjustment defect in tape transport system or component part installation defect.
    - ⇒ Readjust the tape transport system or reinstall the parts. (Refer to the maintenance manual part 2, volume-1.)
  - EQ-56 board defect
  - Drum assembly defect
- Or if the message “Auto Adjust Failure” is displayed, the possible above and following cause are considered.
- Brush/slip ring assembly defect or its part installation/connection defect
    - ⇒ Replace or reinstall the brush/slip ring assembly.  
(Refer to the maintenance manual part 2, volume-1.)
  - Harness (between EQ-56 board and drum assembly) connection defect

## A1F : NV-RAM CONTROL

The A1F : NV-RAM CONTROL menu is used to save the RF adjustment data adjusted in the RF ADJUST mode in NV-RAM. The adjustment data of A30 : EQ VR adjusted in the BETACAM PB ADJUST mode is also saved in this menu.

The current adjustment data can return to the former state when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in NV-RAM.

### Notes

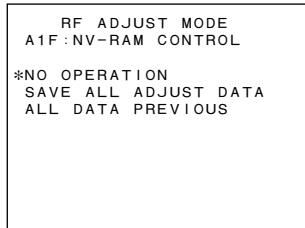
- Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when message “Auto Adjust Failure” or “Condition NG” is displayed).
- When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

### To execute the menu

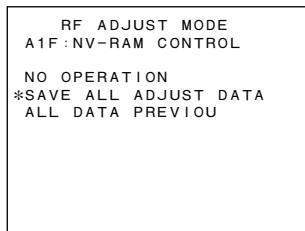
- (1) Turn the search dial and move the \* mark on the superimpose picture as described below.  
To save the adjustment data after adjustment:  
⇒ “SAVE ALL ADJUST DATA”  
To return to the adjustment data before adjustment  
⇒ “ALL DATA PREVIOUS”
  - In a time data display area, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.
- (2) Push the SET button.
  - The data transmission is initiated when the SET button is pushed.
  - Message “Saving ...” or “Loading ...” is displayed on the superimpose picture, and message “SAVING” or “LOADING” is displayed in the time data display area.
- (3) Confirm that the data transmission is completed.
  - After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the superimpose picture, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the time data display area.
- (4) Push the MENU button to terminate the menu.

### Example of display and operation (In data save)

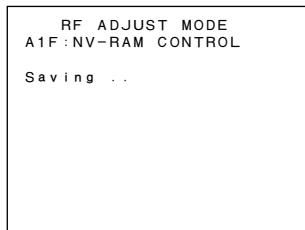
Superimpose picture



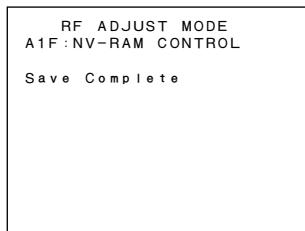
(1) ↓ DIAL (Ω)



(2) ↓ SET



↓

(3) ↓ Confirm  
(4) ↓ MENU

Time data display area



### 4-2-8. AUDIO/VIDEO ADJUST Mode (A2)

The A2 : AUDIO/VIDEO ADJUST mode is used to adjust the audio and video systems.

This unit has three menus.

In an A23 : CP VR menu, one submenu is available.

A2 : AUDIO/VIDEO ADJUST

- A20 : VPR VR
- A2F : NV-RAM CONTROL

#### Menu Tree of Audio/Video Systems Adjustment Mode

#### CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in Section 6 of this manual or the maintenance manual part 2, volume-1.

If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu or turn off the power of this unit without selecting an A2F : NV-RAM CONTROL menu.  
Never execute SAVE ALL ADJUST DATA.

The adjustment menus other than submenu A231 is used for manual adjustment.

In the submenu A231, automatic adjustment (AUTO) or manual adjustment (MANUAL) can be selected.

For the automatic adjustment, refer to the operation example described in each menu.

### To change the adjustment data manually

- (1) Turn the search dial on the superimpose picture and move the \* mark to the item to be adjusted.  
Turn the search dial in the time data display area and display the item to be adjusted.
- (2) Turn the search dial while pressing the JOG button.  
The adjustment data then increases or decreases.

### To execute the automatic adjustment

- (1) Turn the search dial on the superimpose picture and move the \* mark to “MANUAL”.  
Turn the search dial in the time data display area and display “MANUAL”.
- (2) Turn the search dial in FORWARD (↻) direction while pressing the JOG button. Message “Auto (Push SET Button)” is then displayed on the superimpose picture, and message “PUSH SET” is displayed in the time data display area.
- (3) The automatic adjustment is executed when the SET button is pushed.
  - Only the display on the superimpose picture changes as described below. The displayed data value also changes.

Auto adjusting .. :	Automatic adjustment is in progress.
Auto Adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

**To return the adjustment data to the former state**  
Execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

**Note**

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

### To save the adjustment data

Execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.

## A20: VPR VR

AUDIO/VIDEO ADJUST MODE  
A20:VPR VR

*REF 1ST FLD DET	80
VIDEO 1 LEVEL	80
VIDEO 2 LEVEL	80
INT 4FSC FREQ	80

AUDIO/VIDEO ADJUST MODE  
A20:VPR VR

*VIDEO 1 LEVEL	80
VIDEO 2 LEVEL	80

(525/60 System) DNW-A22 (625/50 System)

AUDIO/VIDEO ADJUST MODE  
A20:VPR VR

*REF 1ST FLD DET	80
VIDEO 1 LEVEL	80
VIDEO 2 LEVEL	80
INT 4FSC FREQ	80

AUDIO/VIDEO ADJUST MODE  
A20:VPR VR

*VIDEO 1 LEVEL	80
VIDEO 2 LEVEL	80

(625/50 System) DNW-A22P (525/60 System)

This menu is used to adjust the reference signal and analog video output systems on the VPR-17 board. In 525/60 and 625/50 systems, the displayed adjustment items differ.

The adjustment item below can be adjusted in only a 525/60 system (DNW-A22) or a 625/50 system (DNW-A22P). If this item is not adjusted, failure also occurs in the other system.

Adjustment item	Description
REF 1ST FLD DET	First-field detection timing of reference signal
INT 4FSC FREQ	Free-running frequency of internal reference signal 4fsc

The adjustment item below must be adjusted in both 525/60 and 625/50 systems.

Adjustment item	Description
VIDEO 1 LEVEL	Composite video output (1/2) level
VIDEO 2 LEVEL	Composite video output (3) level

## A2F : NV-RAM CONTROL

The A2F : NV-RAM CONTROL menu is used to save the audio/video adjustment data adjusted in the AUDIO/VIDEO ADJUST mode in NV-RAM.

The current adjustment data can return to the state before adjustment when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in the NV-RAM.

### Note

When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

### To execute the menu

- (1) Turn the search dial and move the \* mark on the superimpose picture as described below.  
To save the adjustment data after adjustment  
⇒ “SAVE ALL ADJUST DATA”  
To return to the adjustment data before adjustment  
⇒ “ALL DATA PREVIOUS”
  - In a time data display area, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.
- (2) Push the SET button.
  - The data transmission is initiated when the SET button is pushed.
  - Message “Saving...” or “Loading...” is displayed on the superimpose picture, and message “SAVING” or “LOADING” is displayed in the time data display area.
- (3) Confirm that the data transmission is completed.
  - After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the superimpose picture, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the time data display area.
- (4) Push the MENU button to terminate the menu.

### Example of display and operation

#### (In data save)

Superimpose picture

AUDIO/VIDEO ADJUST MODE  
A2F:NV-RAM CONTROL

\*NO OPERATION  
SAVE ALL ADJUST DATA  
ALL DATA PREVIOUS

Time data display area

NO OPERATION

(1) ↓ DIAL (Q)

AUDIO/VIDEO ADJUST MODE  
A2F:NV-RAM CONTROL

NO OPERATION  
\*SAVE ALL ADJUST DATA  
ALL DATA PREVIOUS

SAVE ALL ADJUST

(2) ↓ SET

AUDIO/VIDEO ADJUST MODE  
A2F:NV-RAM CONTROL

Saving ...

SAVING



AUDIO/VIDEO ADJUST MODE  
A2F:NV-RAM CONTROL

Save Complete

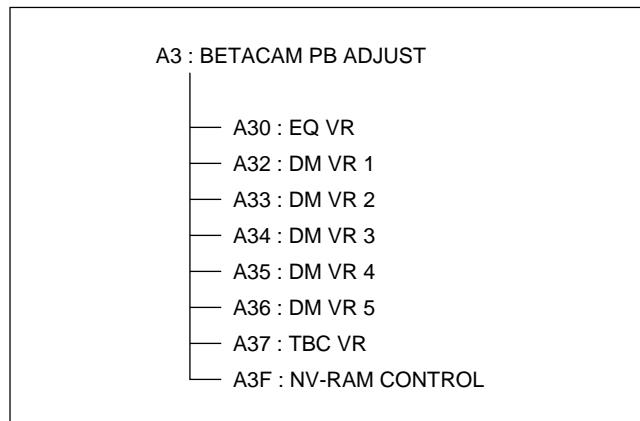
SAVE COMPLETE

(3) ↓ Confirm

(4) ↓ MENU

## 4-2-9. BETACAM PB ADJUST Mode (A3)

The A3 : BETACAM PB ADJUST mode is used to adjust the PB system based on a Betacam/Betacam SP format. This mode contains the eight menus below.



**Menu Tree of BETACAM PB Adjustment Mode**

### CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in Section 6 of this manual or the maintenance manual part 2, volume-1.

If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A3F : NV-RAM CONTROL menu or turn off the power of this unit without selecting an A3F : NV-RAM CONTROL menu.

Never execute SAVE ALL ADJUST DATA.

### Note

Betacam/Betacam SP PB function of DNW-A22 is for NTSC (525/60) system only.

Betacam/Betacam SP PB function of DNW-A22P is for PAL (625/50) system only.

### To change the adjustment data manually

- (1) Turn the search dial on the superimpose picture and move the \* mark to the adjustment item.  
Turn the search dial in the time data display area and display the item to be adjusted.
- (2) Turn the search dial while pressing the JOG button.  
The adjustment data then increases or decreases.

### To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in an A3F : NV-RAM CONTROL menu.

### Note

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

### To save the adjustment data

Execute SAVE ALL ADJUST DATA in an A3F : NV-RAM CONTROL menu.

### Note

In a time data display area, the adjustment item name on the superimpose picture is omitted during display as follows:

RF GAIN	⇒ GAIN
GUARD BAND	⇒ GUARD
METAL	⇒ M
OXIDE	⇒ O

## A30 : EQ VR

BETACAM PB ADJUST MODE	
A30 : EQ VR	
*RF GAIN METAL-Y-A	58
RF GAIN METAL-Y-B	59
RF GAIN METAL-C-A	48
RF GAIN METAL-C-B	4D
RF GAIN OXIDE-Y-A	72
RF GAIN OXIDE-Y-B	75
RF GAIN OXIDE-C-A	5A
RF GAIN OXIDE-C-B	5C

This menu is used to adjust the gain of the PB RF amplifier (EQ-56 board) based on a Betacam/Betacam SP format. There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

## A32 : DM VR 1

BETACAM PB ADJUST MODE	
A32 : DM VR 1	
*EQ1 METAL-Y-A	7F
EQ1 METAL-Y-B	81
EQ1 METAL-C-A	77
EQ1 METAL-C-B	81
EQ1 OXIDE-Y-A	AD
EQ1 OXIDE-Y-B	AF
EQ1 OXIDE-C-A	94
EQ1 OXIDE-C-B	9D

This menu is used to adjust the frequency characteristics of a primary cosine equalizer (DM-89 board). There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

**A33 : DM VR 2**

BETACAM PB ADJUST MODE  
A33:DM VR 2

*MAIN METAL-Y-A	BC
MAIN METAL-Y-B	BC
MAIN METAL-C-A	91
MAIN METAL-C-B	91
MAIN OXIDE-Y-A	A8
MAIN OXIDE-Y-B	A8
MAIN OXIDE-C-A	A0
MAIN OXIDE-C-B	A0

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (main)(DM-89 board).

There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

**A34 : DM VR 3**

BETACAM PB ADJUST MODE  
A34:DM VR 3

*SUB METAL-Y-A	A4
SUB METAL-Y-B	A4
SUB METAL-C-A	70
SUB METAL-C-B	70
SUB OXIDE-Y-A	B6
SUB OXIDE-Y-B	B6
SUB OXIDE-C-A	AA
SUB OXIDE-C-B	AA

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (sub)(DM-89 board).

There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

**A35 : DM VR 4**

BETACAM PB ADJUST MODE  
A35:DM VR 4

*GUARD BAND METAL-Y	22
GUARD BAND METAL-C	1A
GUARD BAND OXIDE-Y	26
GUARD BAND OXIDE-C	2F
OMC DC METAL-Y	E4
OMC DC METAL-C	D0
OMC DC OXIDE-Y	D0
OMC DC OXIDE-C	D0

This menu is used to adjust the guard band width and to set the DC offset level of an over-modulation compensation circuit.

There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of video channels (Y and C).

**A36 : DM VR 5**

BETACAM PB ADJUST MODE  
A36:DM VR 5

*DO TH METAL-Y	1A
DO TH METAL-C	12
DO TH OXIDE-Y	2E
DO TH OXIDE-C	27
ENV-TH-H	20
ENV-TH-L	10

This menu is used to adjust the dropout threshold level and to set the RF envelope threshold level.

Metal and oxide tapes are used for the adjustment of a dropout threshold level. The adjustment item is provided proportionally to the number of video channels (Y and C). High (H) and low (L) limits are used for the setting of an RF envelope threshold level.

**A37 : TBC VR**

BETACAM PB ADJUST MODE  
A37:TBC VR

*SQ-Y RZ	4B
SQ-C RZ	6F
VISC PHASE	06

This menu is used to set the read clock timing and the data of a PB VISC phase detection circuit on the TBC-23 board. The adjustment item is provided proportionally to the number of video channels (Y and C) for read clock timing setting.

## A3F : NV-RAM CONTROL

The A3F : NV-RAM CONTROL menu is used to save the Betacam PB adjustment data adjusted in the BETACAM PB ADJUST mode in NV-RAM.

The current adjustment data can return to the state before adjustment when “ALL DATA PREVIOUS” is selected before the adjustment data is recorded in the NV-RAM.

### Note

When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

### To execute the menu

- (1) Turn the search dial and move the \* mark on the superimpose picture as described below.  
To save the adjustment data after adjustment  
⇒ “SAVE ALL ADJUST DATA”  
To return to the adjustment data before adjustment  
⇒ “ALL DATA PREVIOUS”
  - In a time data display area, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.
- (2) Push the SET button.
  - The data transmission is initiated when the SET button is pushed.
  - Message “Saving...” or “Loading...” is displayed on the superimpose picture, and message “SAVING” or “LOADING” is displayed in the time data display area.
- (3) Confirm that the data transmission is completed.
  - After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the superimpose picture, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the time data display area.
- (4) Push the MENU button to terminate the menu.

### Example of display and operation (In data save)

Superimpose picture

BETACAM PB ADJUST MODE  
A3:NV-RAM CONTROL

\*NO OPERATION  
SAVE ALL ADJUST DATA  
ALL DATA PREVIOUS

Time data display area

NO OPERATION

(1) ↓ DIAL (Ω)

BETACAM PB ADJUST MODE  
A3:NV-RAM CONTROL

NO OPERATION  
\*SAVE ALL ADJUST DATA  
ALL DATA PREVIOUS

SAVE ALL ADJUST

(2) ↓ [SET]

BETACAM PB ADJUST MODE  
A3:NV-RAM CONTROL

Saving ...

SAVING



BETACAM PB ADJUST MODE  
A3:NV-RAM CONTROL

Save Complete

SAVE COMPLETE

(3) ↓ Confirm

(4) ↓ [MENU]

## 4-3. Error Logger Display Mode (M2)

### 4-3-1. Outline

This unit has an error log function that records the error generated or detected in this unit.

The error logger display mode is used to superimpose the contents (data) of the error log on the video monitor. The ordinary display mode (refer to Section 4-3-2) and the setting mode (refer to Section 4-3-3) that displays the menu to limit the error log display are available in this unit.

The calendar/clock date incorporated into this unit can be set in the setting mode.

---

#### Error Log

The recorded error log is classified into three categories: TAPE ERROR, WARNING, and CONDITION. (The error log belongs to the three types.)

Each log is constituted by a message, error generation date, and time code.

The message varies depending on the type of a log.

The error generation date is the date based on the calendar and clock of this unit. (The year is omitted.)

The time code records the time code (LTC) data that is stored in this unit at the error occurs.

The maximum number of stored log is 300. If the number of log exceeds 300, the contents of oldest error log is erased sequentially.

#### TAPE ERROR

An error code and error message are recorded as a message when the error (error codes 01 to 99) occurs.

When multiple sub-error messages are displayed, the three sub-error messages from the top are recorded.

For the error message, refer to Section 3.

#### WARNING

The warning log below is recorded in an error log.

- REFERENCE MISSING

This message is recorded when no signal is input to the REF VIDEO (reference video signal) connector after the power is turned on.

#### CONDITION

The condition logs below are recorded in an error log.

- VIDEO PB CONDITION RED

This message is recorded when the channel condition becomes red during video PB operation.

- AUDIO PB CONDITION RED

This message is recorded when the channel condition becomes red during audio PB operation.

## 4-3-2. Display Mode

The operation in the ordinary display mode is described based on a display example on the superimpose picture. The log number/total log count is displayed in the second line. “(001/000)” is displayed when no log exists. The third to tenth lines (eight lines) are the area where logs are displayed. The three-digit number on the left indicates the log number. The contents of a log are displayed on its right.

A calendar/clock is displayed on the lowest line.

### Notes

- The top screen on the right is the example displayed when the error logger mode is first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- In a time data display area, only the log number/total log count (e.g., “ERR LOG 001/03”) is displayed.

### Search dial (JOG mode)

To display the log number not displayed on the screen, turn the search dial and move the \* mark.

### CTL/TC/UB button

On this screen, the whole message is displayed partially. To display other information (date and time code), push the CTL/TC/UB button.

### F FWD button

The whole contents of a log to which the \* mark was set are displayed while the F FWD button is pressed. The category (error code for TAPE ERROR) of an error log is displayed in the third line. Messages are displayed in the fourth and fifth line s, and sub-error messages in the sixth to eighth lines. The date (not including the year) is displayed in the ninth line, and time code in the tenth line. Other logs can be displayed in this display state when the search dial is turned with the F FWD button pressed.

### RESET button

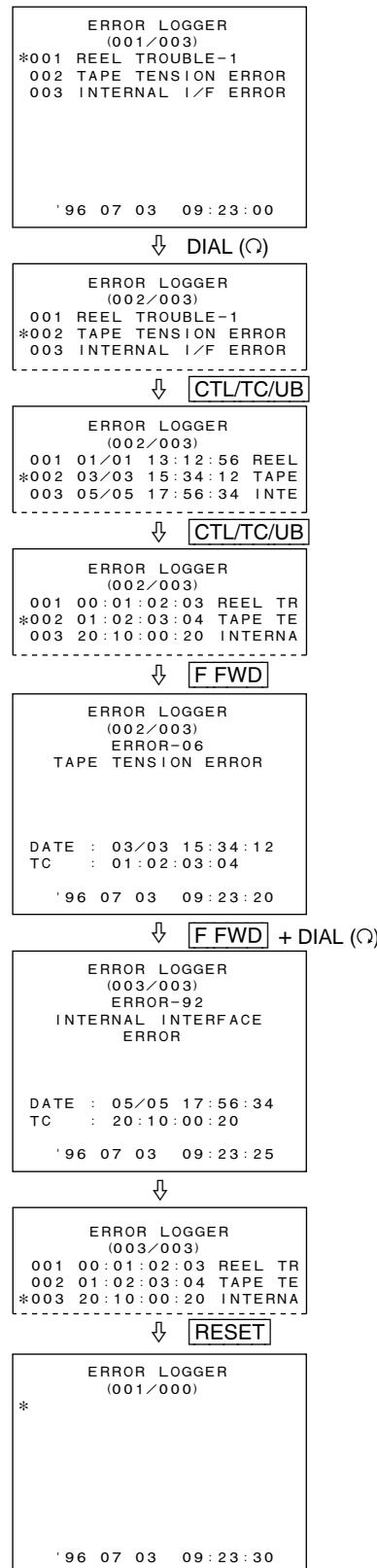
The recorded all logs are erased when the RESET button is pushed.

### Note

Usually, do not erase any log.

There may be some error logs that are useful for confirmation of the progress when a trouble occurs or that are important in preventing a trouble from occurrence.

## Example of display and operation



### SET button

A white square mark is displayed in the upper-right position of the superimpose picture when the SET button is pushed. The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed).

However, the character information (time code or operation status) superimposed during normal operation is not displayed in this case.

To return to the former state, push the MENU button.

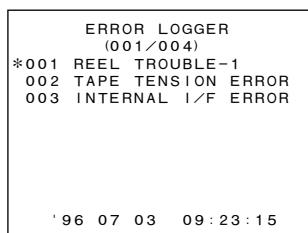
### MENU button

The display returns to the error logger display mode when the MENU button is pushed with the white square displayed in the upper-right position of the superimpose picture.

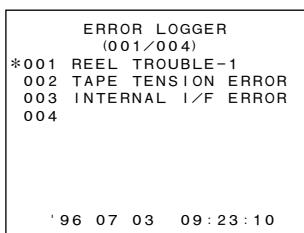
Pushing the MENU button in the error logger display mode terminates the error logger display mode.

### Limited-display screen

For the error log of a category that is set to OFF in the menu of setting mode (refer to Section 4-3-3), information items other than a log number are not displayed. However, the whole display using the F FWD button is not influenced by the setting.

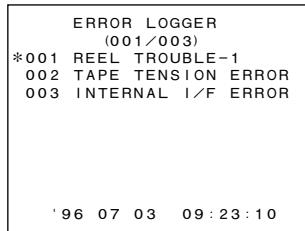


Ordinary Screen  
(No limited-display)

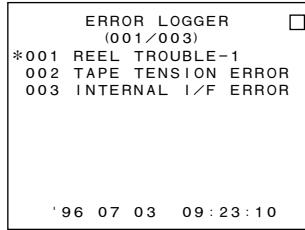


Only Warning Turned Off

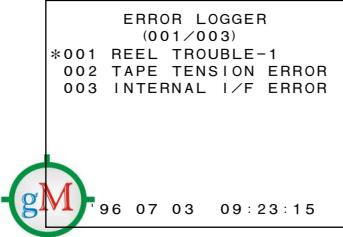
### Example of display and operation



↓ [SET]



↓ [MENU]



### 4-3-3. Setting Mode

The setting mode is used to display a menu that limits the display of an error log. In this menu, the display can be turned on and off for each error log category. A calendar/clock can also be set in this menu.

#### Notes

- The top and second screens on the right are the examples displayed when the error logger mode and setting mode are first activated after the power is turned on. The second-time or later screen is displayed with the preceding display completed.
- A white square mark is displayed in the upper-right position of the superimpose picture as in the display mode when the SET button is pushed in the setting mode (except when “Push SET Button” is displayed during calendar/clock setting). The unit then enters the normal operation state (in which the normal operation of this unit except a menu system can be performed). The former state is returned when the MENU button is pushed.

#### Entering the setting mode

Push the SET button while pressing the STOP button in the display mode.

#### Returning to the display mode

Push the SET button again while pressing the STOP button or push the MENU button.

#### Setting menu

The seventh to tenth lines on the superimpose picture are a setting menu. The display in the display mode is left in the first to fifth lines.

Each setting when the power is turned on is all ON.

The error log belonging to a category is limited in display when each item is set to OFF. (Refer to the “Limited-display screen” on the previous page.)

The changed setting is valid until the power is turned off.

How to change the setting is described below.

- Turn the search dial and move the \* mark to the category to be changed in setting.

#### Notes

- In a time data display area, the contents of the \*-marked line are displayed on the superimpose picture.
- Turn the search dial continuously in FORWARD (Q) direction for the calendar/clock setting. (Refer to the next page.)

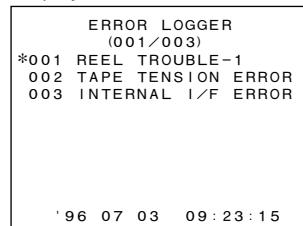
- To change the setting from ON to OFF, turn the search dial in REVERSE (Q) direction while pressing the JOG button.

To change it from OFF to ON, turn the search dial in FORWARD (Q) direction while pressing the JOG button.

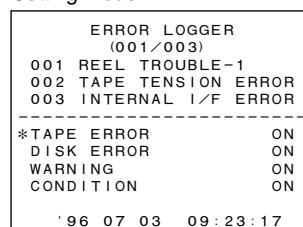
- To change the setting of other categories, repeat steps (1) and (2).
- Push the MENU button to terminate the setting mode.

#### Example of display and operation

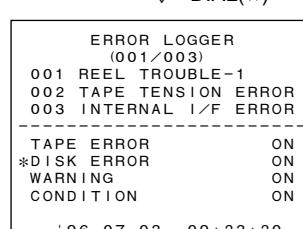
##### Display mode



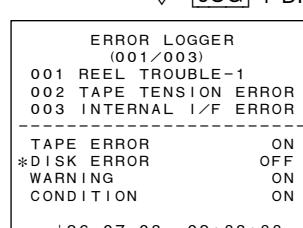
Setting mode ↓ [STOP] + [SET]



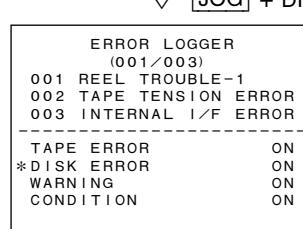
↓ DIAL(Q)



↓ [JOG] + DIAL(Q)



↓ [JOG] + DIAL(Q)



### Calendar/clock setting

The calendar/clock's date and time of this unit can be adjusted in the setting mode as described below.

In a display/operation example on the right, 9:23 of July 3rd in 1996 is set to 15:00 of August 1st in 1996.

- (1) Turn the search dial slowly and turn on and off the numerical value (year, month, day, hour, minute, or second) of the calendar/clock item to be changed.

#### Notes

- When a \* mark is displayed in the setting menu, turn the search dial continuously in FORWARD (Q) direction until the numerical value blinks. For the calendar/clock setting, a \* mark is not displayed on the superimpose picture.
- Do not turn the search dial excessively in REVERSE (Q) direction during setting. An \* mark is displayed in the setting menu and the calendar/clock setting is stopped.

- (2) Turn the search dial while pressing the JOG button and change the numerical value to the desired one.

#### Notes

- The count display of seconds stops when the numerical value is changed. The internal data is updated.
- On the superimpose picture, message "Push SET Button" is displayed in the upper line.

- (3) Repeat steps (1) and (2) until the numerical values in other items are changed completely.

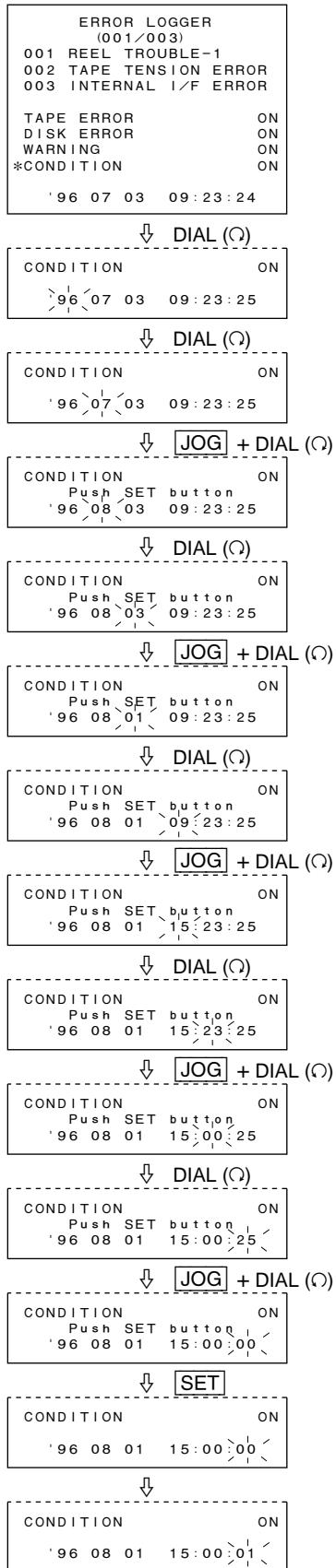
- (4) Push the SET button to save the setting values.

#### Notes

- To change only the date, the time must also be set again.
- To cancel the calendar/clock setting, terminate the setting mode or turn the search dial in REVERSE (Q) direction until a \* mark is displayed in the setting menu (the setting menu item is displayed for a time data display area).
- The unit enters the normal operation state when the SET button is pushed with message "Push SET Button" not displayed on the superimpose picture. Push the MENU button to return to the former state.
- To set the time accurately, push the SET button immediately the display and current time coincided.

- (5) Push the MENU button to terminate the setting mode.

### Example of display and operation



## Section 5

# Periodic Maintenance and Inspection

This section explains about periodic maintenance and how to clean.

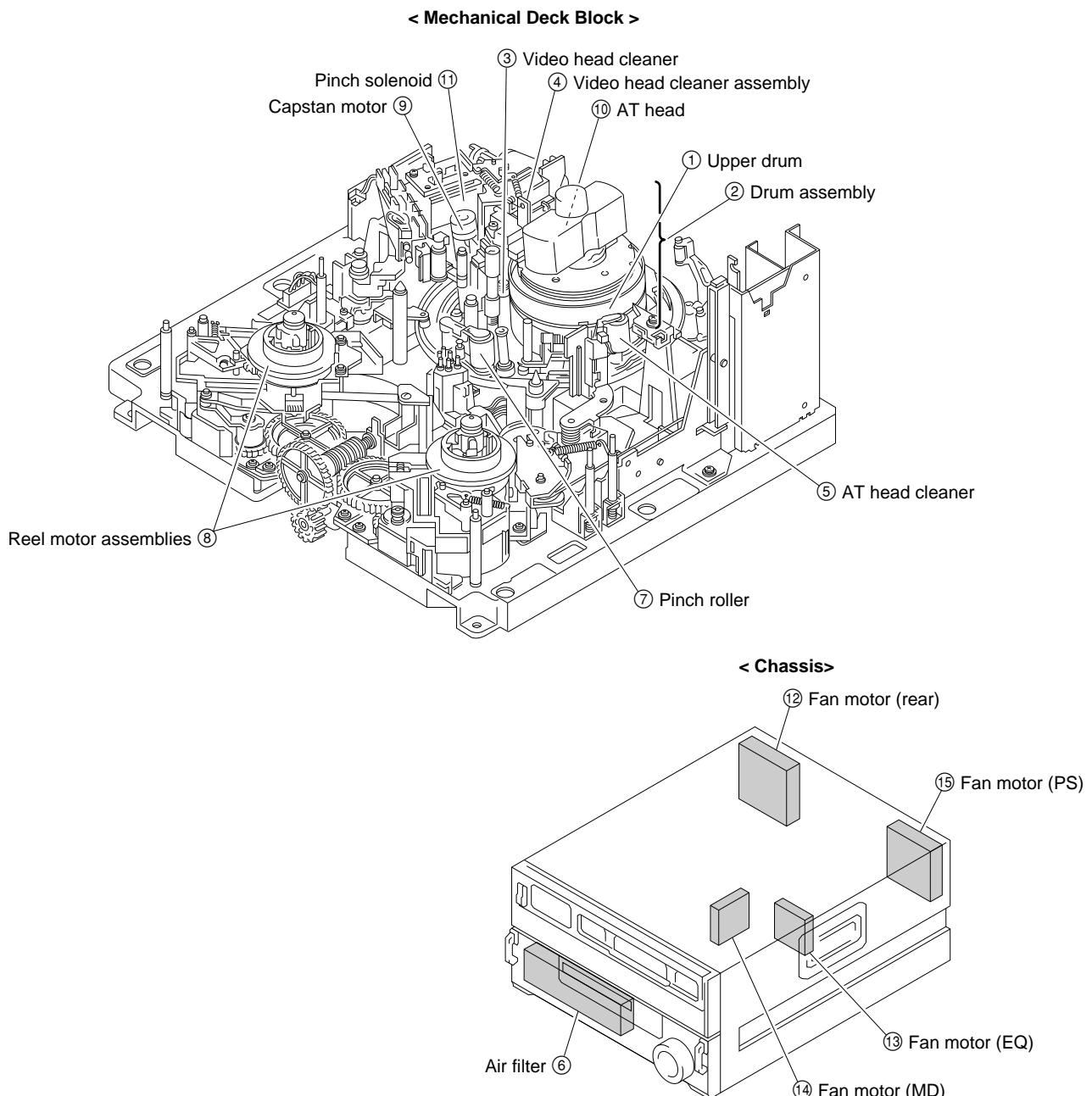
### 5-1. Periodic Maintenance

To make the most of the functions, fully realize the performances of this unit and to lengthen the life of the unit, periodic check and parts replacement are recommended.

#### 5-1-1. Index

It is necessary to check and replace periodically to the following parts.

The numbers in the illustration correspond to the table in the next page.



## 5-1-2. Periodic Replacement and Check Item Table

The replacement time shown in the following table is not the guarantee term of parts. The replacement time of parts varies depending on the operating environment and conditions of the unit.

Especially, the pinch roller, cleaners and air filter may be required replacing earlier than replacement period shown in table depending on their dirt or abrasion.

The part with arrow “↓” in the table is included in the part pointed by the arrow.

When the part pointed by the arrow is to be replaced, the part with the arrow will be replaced at the same time.

Refer to Section 5-1-3 for the hours meter.

R : Replace the part      C : Perform check (adjustment)

No.	Replacement parts	Hours meter (Menu No.)	Inspection hours (h)							
			1000	2000	3000	4000	5000	6000		
1	Upper drum	Drum rotating time (H02)		R		R			↓	
2	Drum assembly *1	Drum rotating time (H02)							R	
3	Video head cleaner	Drum rotating time (H02)	C *4	R	C *4	R	C *4		↓	
4	Video head cleaner assembly *2 *3	Drum rotating time (H02)							R	
		Threading times (H04)	Replace when used 200,000 times							
5	AT head cleaner	Drum rotating time (H02)	C *4	R	C *4	R	C *4	R		
6	Air filter	Air filter use time (H15)							R	
7	Pinch roller	Tape running time (H03)	C *4	R	C *4	R	C *4	R		
8	Reel motor	Tape running time (H03)				R				
9	Capstan motor	Tape running time (H03)							R	
10	AT head	Tape running time (H03)			C *5				R	
11	Pinch solenoid *3	Tape running time (H03)							R	
		Threading times (H04)	Replace when used 200,000 times							
12	Fan motor (rear)	Energized time (H01)	Replace when used 400,000 hours							
13	Fan motor (EQ)	Energized time (H01)	Replace when used 400,000 hours							
14	Fan motor (MD)	Energized time (H01)	Replace when used 400,000 hours							
15	Fan motor (PS)	Energized time (H01)	Replace when used 400,000 hours							

\*1 Drum assembly includes an upper drum and a brush slip ring.

\*2 Video head cleaner assembly includes a video head cleaner.

\*3 Replace these parts when the replacement period or count is reached whichever is earlier.

\*4 Check that the shape is not deformed and that is not dirty by visual.

\*5 For DNW-A30/A30P only, perform the LAU PB frequency response check (METAL and OXIDE) referring to Section 6-2.

Part No.	Name	Q'ty	Note
A-8313-970-A	Upper drum DJR-17A-R	1	
A-8313-969-A	Drum DJH-17A-R	1	
X-3167-281-3	Roller assy, V cleaning	1	
3-182-765-02	CR spacer	1	
A-8267-398-J	Video head cleaner assembly	1	
X-3167-053-2	Arm assy, CL	1	
3-603-810-01	Filter	1	
X-3167-054-3	Arm assy, pinch	1	
A-8267-774-C	RM assy	2	
1-698-179-12	Motor, DC (capstan)	1	
8-825-779-02	Audio head (PS244-2103J)	1	
1-454-338-00	Solenoid, plunger	1	
1-698-939-11	Fan, DC (92 square)	1	
1-698-786-11	Fan, DC (60 square)	1	
1-698-857-11	Fan, DC (60 square)	1	
1-698-812-11	Fan, DC (80 square)	1	

Replace the parts shown in the table below periodically when the threading/threading operation is repeated frequently.

Replacement parts	Replacement period	Part No.	Name	Q'ty
Brake solenoid	Every 200,000 times of threading	1-454-417-31	Solenoid, Plunger	1
S tension regulator	Every 200,000 times of threading	A-8267-795-D	Tension regulator assy (RP)	1
T tension regulator	Every 200,000 times of threading	A-8267-423-B	T tension regulator assy	1
T drawing arm assembly	Every 200,000 times of threading	A-8278-313-A	Drawer assy (T)	1
Gear box assembly	Every 200,000 times of threading	A-8267-424-A	Box assembly, Gear	1
Threading ring assembly	Every 200,000 times of threading	A-8267-395-E	Ring assembly, Threading	1
Ring roller	Every 200,000 times of threading	3-180-677-01	Roller, Ring	2
		3-180-679-01	Roller (B), Ring	1
Pinch arm guard	Every 200,000 times of threading	3-180-853-01	Guard, Pinch arm	1
CL guide rail	Every 200,000 times of threading	3-180-874-02	Rail, CL guide	1
Cassette compartment assembly	Every 200,000 times of threading	A-8267-589-D	Cassette compartment (RP)	1
Video head cleaner	Every 1,000 hours of drum rotating	X-3167-281-3	Roller assy, V cleaning	1
		3-182-765-02	CR spacer	1
AT head cleaner	Every 1,000 hours of drum rotating	X-3167-053-2	Arm assy, CL	1
Pinch roller	Every 1,000 hours of drum rotating	X-3167-054-3	Arm assy, Pinch	1

### 5-1-3. Hours Meter

This unit can display an hours meter on the time data display area of the lower control panel. Perform a periodic check with this hours meter as a reference.

#### 1. Contents of display

Menu No.	Display	Contents
H01	OPERATION HOURS	Sum of energized time
H02	DRUM RUNNING HOURS	Sum of drum rotating time
H03	TAPE RUNNING HOURS	Sum of tape running time
H04	THREADING COUNTER	Sum of threading
H12	DRUM RUNNING HOURS	Sum of drum rotating time (Resettable)
H13	TAPE RUNNING HOURS	Sum of tape running time (Resettable)
H14	THREADING COUNTER	Sum of threading (Resettable)
H15	AIRFILTER OPERATION HOURS	Sum of air filter use time (Resettable)

#### 2. Display procedures

- (1) Press the MENU button on the lower control panel.
- (2) Put the “\*” to the desired ITEM by turning the SEARCH dial.
- (3) Press the SET button on the lower control panel to display the hours meter.
- (4) Press the MENU button once and repeat from step (2) to display other ITEM.

Press the MENU button twice to exit the MENU.

## 5-2. Cleaning

To make the most of the functions, fully realize the performance of this unit, and to lengthen the life of the unit and tape, clean the components often.

### 5-2-1. Cleaning by Cleaning Tape

If the video heads are clogged, clean the video head as the following procedure. Make sure to use the specified cleaning tape. If other tape is used, unusual abrasion or damage of the video heads may occur.

Specified cleaning tape: BCT-5CLN

#### Procedure

1. Insert the cleaning tape BCT-5CLN to the unit.
2. Press the EJECT and PLAY buttons simultaneously.

The cleaning tape is played back for approx. 5 seconds. After that, the cleaning tape will be ejected automatically.

#### Notes

- If the cleaning tape is not ejected after playing back more than 5 seconds, be sure to press the EJECT button immediately and eject the cleaning tape.
  - Do not place the cleaning tape in the STOP mode, and do not put the unit in fast-forward and rewind modes, because the video heads may be damaged.
3. Confirm that the head clogging is clear.

If the video heads are still clogged after cleaning by cleaning tape, clean them by cleaning cloth. (Refer to Section 5-2-3.)

### 5-2-2. General Information for Cleaning by Cleaning Cloth

#### 1. Cautions

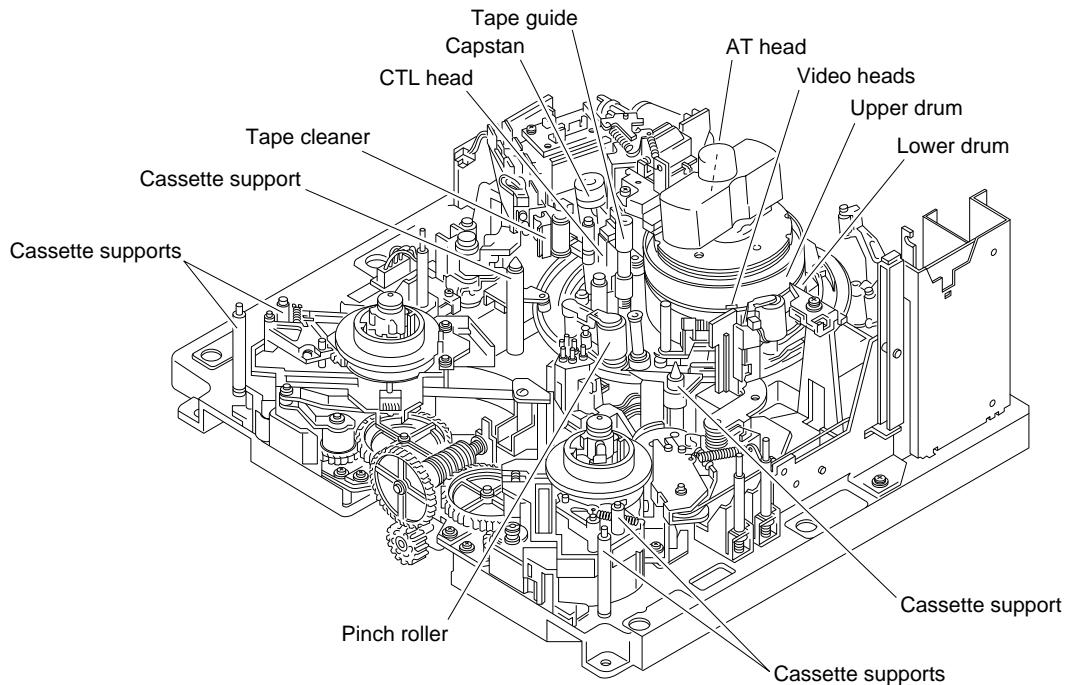
- Be sure turn the power off before cleaning.
- Each block in the mechanical deck consists of a precision part and is adjusted precisely. Be careful not to damage each part and to apply an excessive force during cleaning.
- Do not touch the greased portions during cleaning. If grease attaches to cleaning cloth, replace the cleaning cloth with a new one. If a cleaning cloth smeared with grease is used, grease may attach to the places where it should not.
- Do not insert a cassette tape before a cleaning fluid completely evaporates after cleaning.

#### 2. Preparation

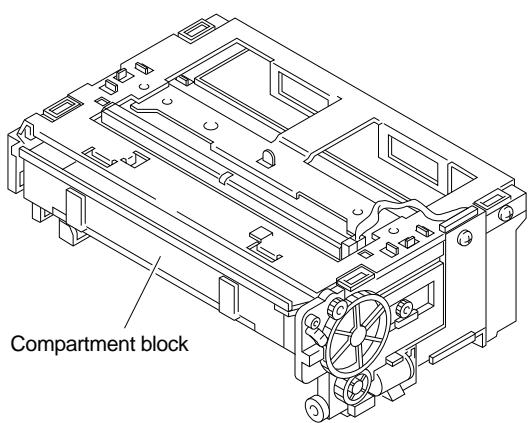
- (1) Turn the power off.
- (2) Remove the upper lid. (Refer to Section 2-3-1.)
- (3) Remove the plate MD assembly. (Refer to Section 2-4.)
- (4) Remove the cassette compartment. (Refer to Section 2-5.)

### 3. Index

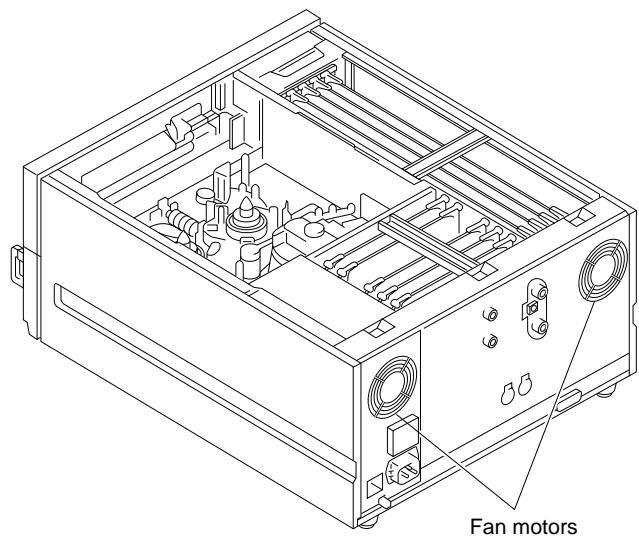
**< Mechanical Deck Block >**



**< Cassette Compartment >**



**< Chassis >**



### 5-2-3. Tape Running Surface of Upper Drum and Video Heads Cleaning

#### Caution

Never touch the rotating drum.

The rotary heads are the part that can be damaged easily. Be careful not to damage the rotary heads during cleaning.

#### Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

#### Note

Do not use a cotton swab to clean the video heads.

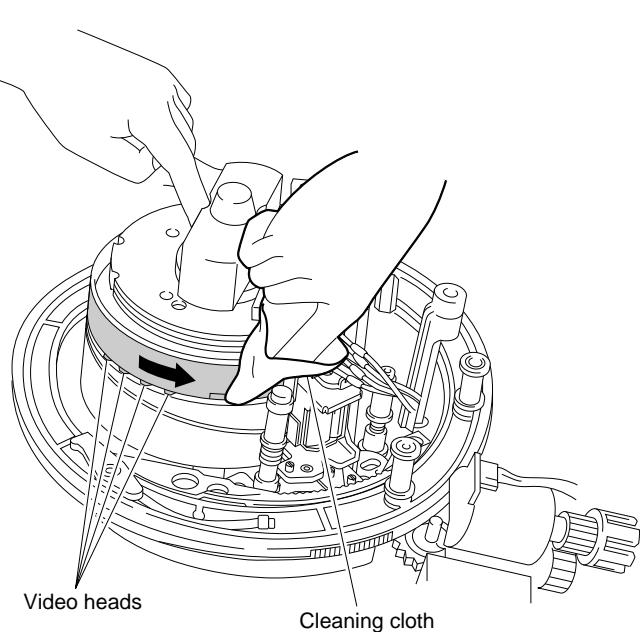
#### Procedures

1. Hold the cleaning cloth moistened with a cleaning fluid keeping it without becoming wrinkled. And press the cleaning cloth slightly against the video heads.
2. Rotate the upper drum slowly counterclockwise two or three turns and clean the tape running surface and video heads with the cleaning cloth held.

#### Note

Be sure to rotate the upper drum counterclockwise and clean the video heads along the circumference. Do not rotate the upper drum in the opposite direction (clockwise) or clean it in the vertical direction. This may damage the rotary heads and the brush slip ring assembly.

3. After cleaning, wipe it with a dry cleaning cloth two or three times.



**Video Heads Cleaning**

## 5-2-4. Tape Running Surface of Lower Drum and Lead Surface Cleaning

### Caution

Be careful not to damage the lower drum (specially lead surface) during cleaning.  
Pay careful attention when cleaning the edge portion above the lower drum because it is located near the video heads.

### Tools

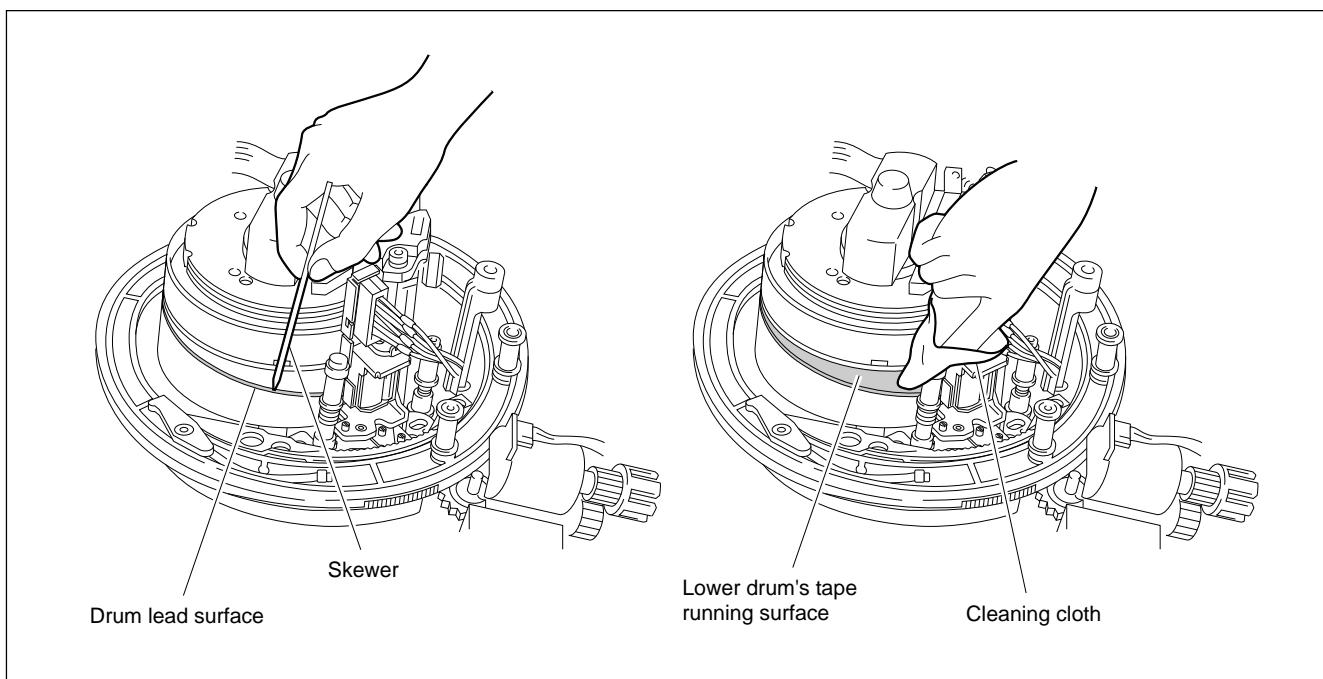
- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Skewer or an equivalent (Never use a metallic skewer. )

### Procedures

1. As shown in the figure, put a skewer (or an equivalent) along the drum lead surface and remove the magnetic powder.

#### Notes

1. Never use a metallic skewer instead of the skewer. This may damage the tape running surface.
2. Tracking may be badly influenced when magnetic powder attaches to the drum lead surface. Remove the magnetic powder completely during cleaning.
2. Clean the drum lead surface and lower drum's tape running surface (shaded portion in the figure) with a cleaning cloth moistened with a cleaning fluid.
3. After cleaning, wipe it with a dry cleaning cloth two or three times.



Tape Running Surface of Lower Drum and Lead Surface Cleaning

## 5-2-5. Stationary Heads Cleaning

### Caution

Be careful not to damage the head surface when cleaning the stationary heads.

### Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

### Procedures

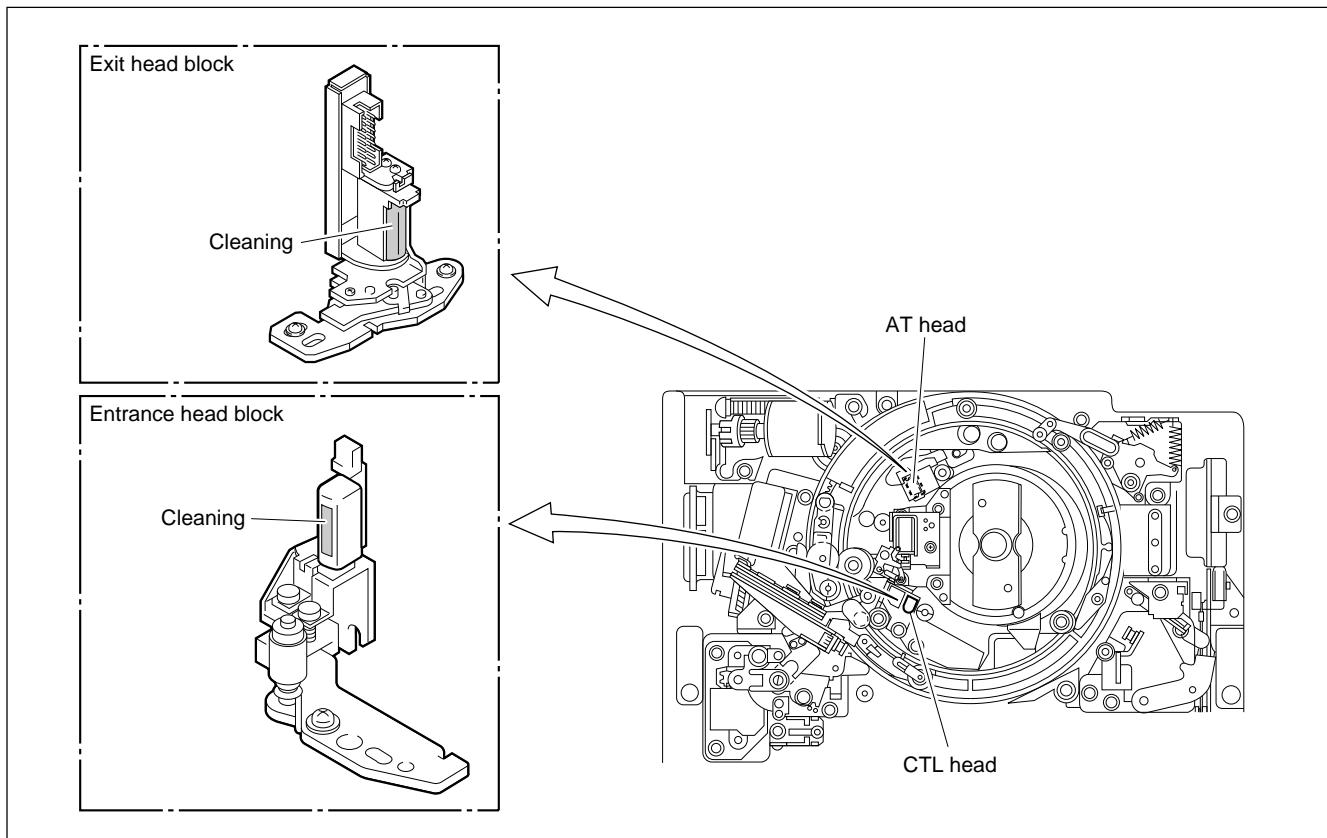
1. Clean the tape running surfaces of the AT head and CTL head in the vertical direction with a cleaning cloth moistened with a cleaning fluid.

#### Note

An error may occur in the playback when magnetic powder attaches to the head gap portion of the AT head and CTL head.

Remove the magnetic powder completely during cleaning.

2. After cleaning, wipe it with a dry cleaning cloth two or three times.



Stationary Heads Cleaning

## 5-2-6. Tape Running System and Tape Cleaner Cleaning

### Warning

The tape cleaner has a sharp edge. Do not touch the edge with bare hands. Pay careful attention when cleaning the tape cleaner.

### Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01

### Procedures

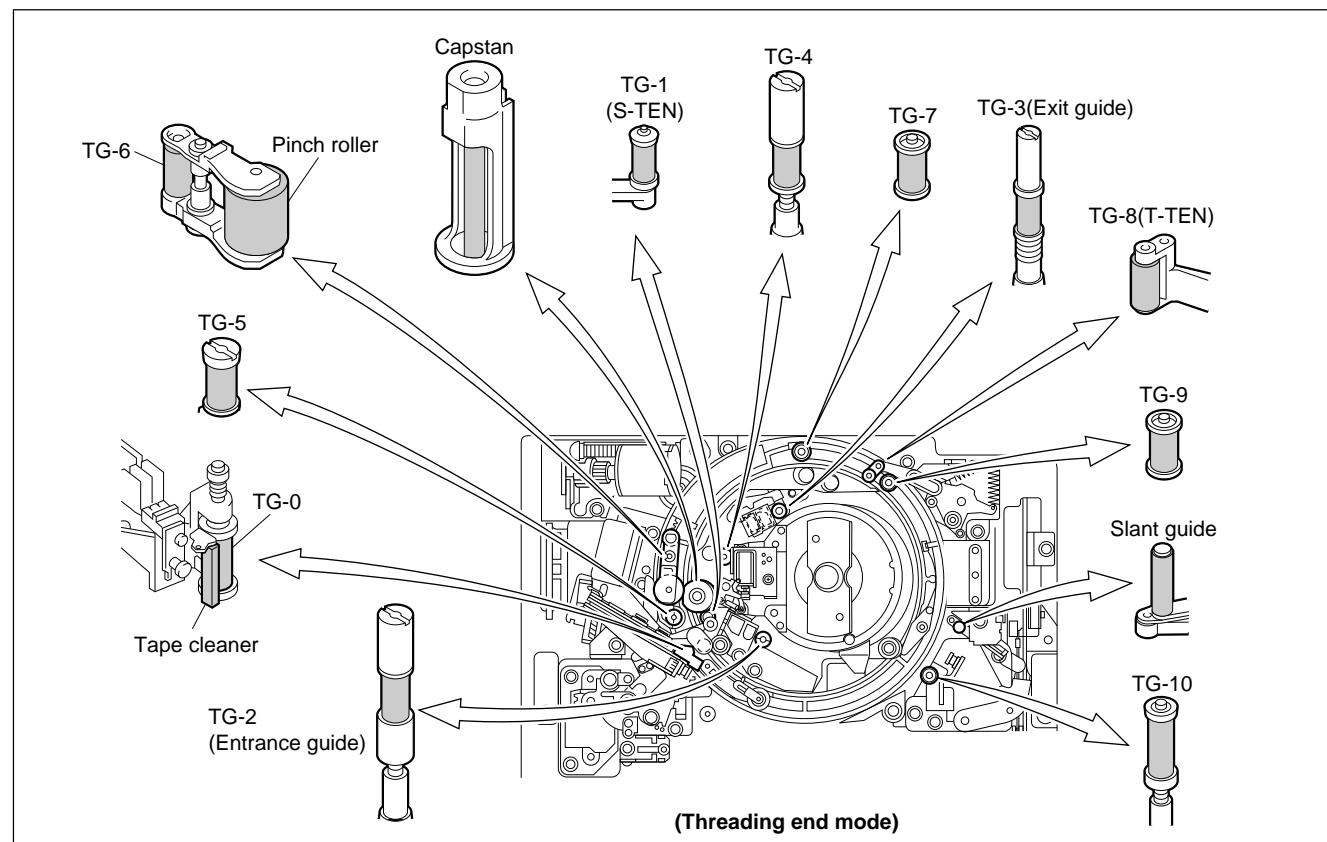
1. Wipe the surface of the tape cleaner using a paper (such as a sheet of paper of this manual) to chip the magnetic powder adhered on the tape cleaner.

#### **WARNING**

Do not touch the edge portion of the tape cleaner with bare hands.

Pay careful not to damage the tape cleaner.

2. Clean the tape running surfaces (shaded portions in the figure) of each guide and the tape cleaner with cleaning cloth moistened with a cleaning fluid.
3. After cleaning, clean them with a dry cleaning cloth two or three times.



**Tape Running System and Tape Cleaner Cleaning**

## 5-2-7. Fan Motors Cleaning

### Notice

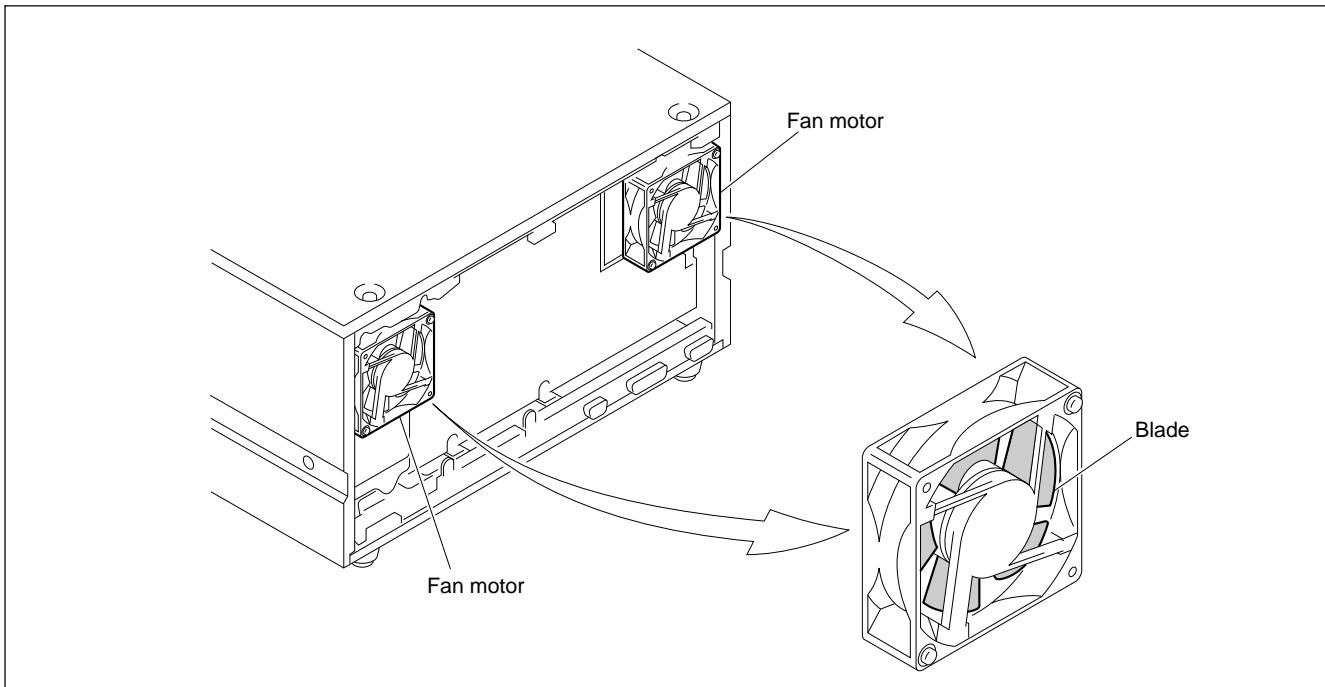
The temperature in the unit increases when dust attaches to the fan motor and when the air flow is disturbed. This may badly influence the performance and life of the unit. Clean the fan motor on the rear panel periodically because it accumulates dust easily.

### Tools

- Cleaning cloth: 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Vacuum cleaner

### Procedures

1. Remove the power panel. (Refer to Section 2-3-4.)  
Disconnection of harness is not necessary.
2. Remove the connector panel. (Refer to Section 2-3-3.)  
Disconnection of harness is not necessary.
3. Remove the dust on the fan motors using a vacuum cleaner.
4. Clean the blades (shaded portion in the figure) with cleaning cloth moistened with a cleaning fluid.
5. Install the connector panel. (Refer to Section 2-3-3.)
6. Install the power panel. (Refer to Section 2-3-4.)



Fan Motor Cleaning

## 5-2-8. Cassette Compartment and Cassette Supports Cleaning

### Notes

- Be careful not to apply an excessive force to the compartment when cleaning the cassette compartment.
- Do not clean the door with alcohol. This may cause a crack.

### Tools

- Cloth (or Gauze)
- Vacuum cleaner

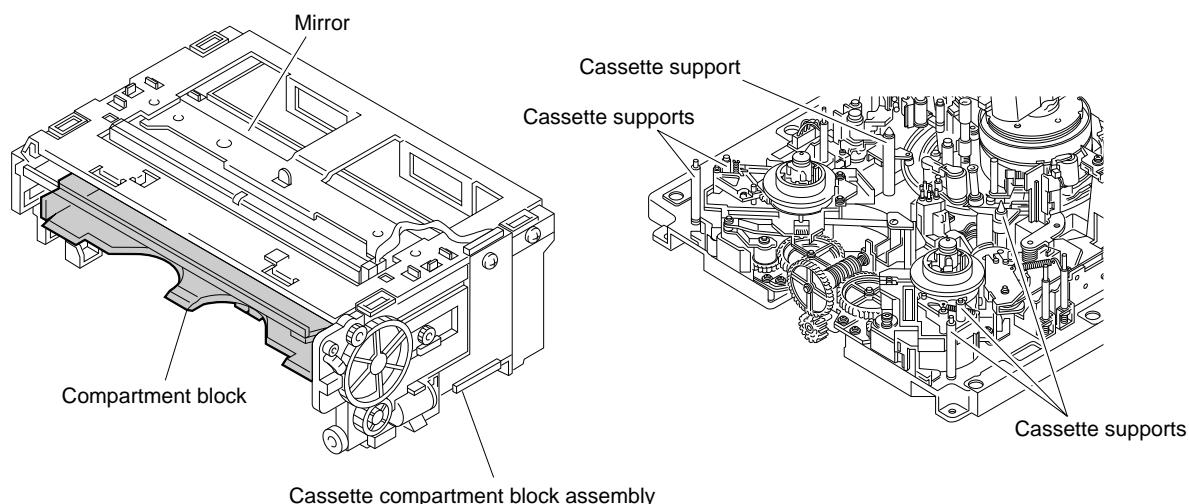
### Procedures

1. Remove the cassette compartment from the unit. (Refer to Section 2-5.)
2. Remove the dust on the cassette compartment from the cassette insertion inlet using a vacuum cleaner.
3. Clean the compartment (shaded portion in the figure) with a dry cloth (or gauze).

**Note**

Do not apply an excessive force to the compartment block.

4. Clean the cassette supports on the mechanical deck with dry cloth (or gauze).



Cassette Compartment Cleaning

## Section 6

### Replacement of Plug-in Boards

#### **6-1. Service Overview for Plug-in Board Replacement**

##### **6-1-1. Notes on Plug-in Board Replacement**

- For the board replacements except plug-in boards, refer to the maintenance manual part 2, volume-1.
- The plug-in board to be installed needs the state with completing the factory adjustment or equivalent. If not, perform the electrical adjustments and confirmations in according with instructions in the maintenance manual part 2, volume-1.
- Never touch (move) the adjustment parts that are not described in Section 6. If move these, requires to perform the electrical adjustments that are described in the maintenance manual part 2, volume-1.
- Do not execute (change) the adjustment items (data) in the maintenance mode that are not described in Section 6. If the adjustment item (data) has been executed (changed) carelessly, do not save the data and turn off the power of the DNW or execute “ALL DATA PREVIOUS” in each NV-RAM control menu. (Never execute “SAVE ALL ADJUST DATA” of each NV-RAM control menu.)
- It is recommended to record the states before replacement on a copy of setting check sheet in Appendix A.  
In case of the change of setting in the adjustments and so on, this recorded setting check sheet is the convenient when resetting the setting after the replacement.
- The SS-63 board of the board numbers 1-661-127-11 and 1-661-127-12 can not be used to the DNW-A22/A22P.
- The DM-89 board of the service parts code suffix-A cannot be used to the DNW-A22/A22P.
- The TBC-23 board of the service parts code suffix-A cannot be used to the DNW-A22/A22P.  
And the board numbers 1-648-543-13 and 1-648-543-14 among the TBC-23 board of the service parts code suffix-B cannot be used to the DNW-A22/A22P in without completing the specified modification to them. Please consult with local Sony's sales/service office in detail.
- Check that the state of 525/625 line system is following state before starting the electrical adjustment.  
For DNW-A22: 525/60 line system  
For DNW-A22P: 625/50 line system  
If not, switch the line system by the setup menu ITEM-013 : 525/625 SYSTEM SELECT in according with Section 7-2-2 in the operation manual.

## 6-1-2. Service Action before/after Plug-in Board Replacement

List up the service action (except function check) after replacing each plug-in board.

Refer to “6-1-3. Pulling out /Insertion of Plug-in Board” for pulling out and insertion of board when Referring section Column of below table is shown “—”.

Board name	Referring section	Service action
APR-12	Section 6-2	Electrical adjustments and Shorting plugs setting
DM-89	Section 6-3	Electrical adjustments
DPR-71	—	None
DPR-73	—	None
EQ-56	Section 6-4	Electrical adjustments
SS-63	Section 6-5	DIP switches setting, Setup menu resetting, Error logging data clear, Calendar/Clock setting, and Serial number setting
TBC-23	Section 6-6	Electrical adjustments and DIP switches setting
TBC-24	Section 6-7	Electrical adjustments
VPR-17	Section 6-8	Electrical adjustments

For the setting of switches and shorting plugs, and the resetting the setup menu (Main and Extended menus), need to record the setting states of before replacement.

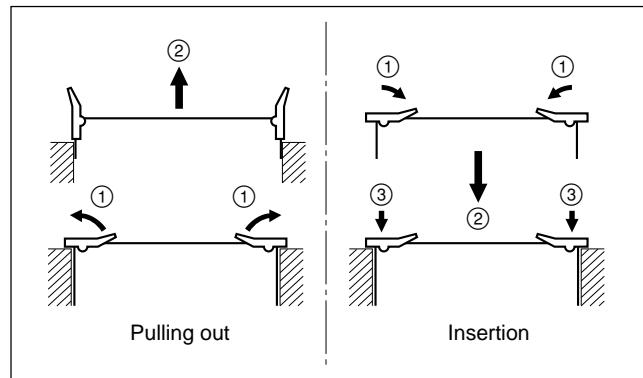
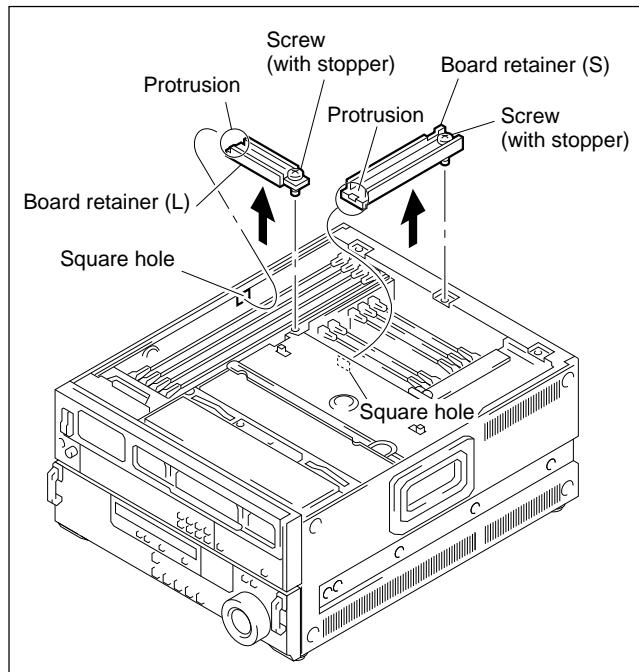
### 6-1-3. Plug-in Board Pulling out/Insertion

**Note**

Turn off the power of DNW and then wait 30 seconds before starting the service operation.

#### Pulling out

- (1) Remove the upper lid. (Refer to “2-3-1. Upper Lid, Side Panels, and Bottom Plate Removal/Installation”.)
- (2) Loosen a screw, and remove the board retainer (L) or (S).
- (4) Pull up the eject levers on the board to the direction of the arrows. (Disconnect it from the motherboard.)
- (5) Hold the eject levers and pull out slowly the board.



- (3) When pulling out the TBC-23 or TBC-24 board, disconnect the connected harness from its board.

TBC-23 board: CN1

TBC-24 board: CN1

#### Insertion

Perform in the reverse procedures of pulling out.

**Notes**

- After board insertion, press the two eject levers simultaneously and connect the firmly to the connector on the motherboard (MB-648 board).
- To install the board retainer, tighten the screw after inserting the protrusion of the board retainer into the square hole of chassis.

## 6-1-4. Equipment List

Shows the lists of the measuring equipment, and tools to be appeared in Section 6.

Right column is the board name that using equipment.

### List for DNW-A22

Analog composite waveform/vector monitor	TEKTRONIX 1750 or 1780R or equivalent TEKTRONIX 1780R or equivalent (With LINE SELECT)	DM-89, VPR-17 TBC-23/24
Oscilloscope	TEKTRONIX 2465B or equivalent	APR-12, DM-89, EQ-56, VPR-17, TBC-24
Spectrum analyzer	ADVANTEST R3261A or equivalent	DM-89
Network analyzer	ANRITSU MS420B or equivalent	DM-89
Audio analyzer	TEKTRONIX AA501A-option 02 or equivalent	APR-12
Audio level meter	HEWLETT-PACKARD HP3400A or equivalent	APR-12
Frequency counter	ADVANTEST TR5821AK or equivalent	VPR-17
Digital voltage meter	ADVANTEST TR6845 or equivalent	DM-89
Extension boards	EX-377 (SONY part No. J-6269-810-A) EX-555 (SONY part No. A-8277-211-A) EX-556 (SONY part No. A-8277-212-A)	DM-89, EQ-56, TBC-23 VPR-17 APR-12
Extension harness	14P (SONY part No. 1-952-684-11)	TBC-24
Composite video monitor	For 525/60 (NTSC) system For 625/50 (PAL) system	APR-12, DM-89, EQ-56, TBC-23/24, VPR-17 VPR-17 <small>(Note)</small>
Terminators	75 Ω, BNC	DM-89, TBC-23/24, VPR-17
BNC T adapter	75 Ω	VPR-17
Cleaning tape	BCT-5CLN (SONY standard products)	DM-89, TBC-23/24
Alignment tapes	CR5-1B (SONY part No. 8-960-096-41) CR5-2A (SONY part No. 8-960-097-44) CR8-1A (SONY part No. 8-960-097-45) SR5-1 (SONY part No. 8-960-075-01)	DM-89, EQ-56, TBC-23/24 DM-89, EQ-56, TBC-23/24 APR-12 EQ-56, VPR-17
Setting clips		APR-12, DM-89

#### Note

If the DNW-A22 is operated on the 625/50 line system, the adjustments for the 625/50 line system are required at the electrical adjustments after the VPR-17 board replacement. In this time, the composite video monitor for 625/50 line system is required to display the maintenance mode screen.

**List for DNW-A22P**

Analog composite waveform/vector monitor	TEKTRONIX 1751 or 1781R or equivalent TEKTRONIX 1781R or equivalent (With LINE SELECT)	DM-89, VPR-17 TBC-23/24
Oscilloscope	TEKTRONIX 2465B or equivalent	APR-12, DM-89, EQ-56, VPR-17, TBC-24
Spectrum analyzer	ADVANTEST R3261A or equivalent	DM-89
Network analyzer	ANRITSU MS420B or equivalent	DM-89
Audio analyzer	TEKTRONIX AA501A-option 02 or equivalent	APR-12
Audio level meter	HEWLETT-PACKARD HP3400A or equivalent	APR-12
Frequency counter	ADVANTEST TR5821AK or equivalent	VPR-17
Digital voltage meter	ADVANTEST TR6845 or equivalent	DM-89
VISC phase adjustment tool	(SONY part No. J-6332-240-A)	TBC-23
Extension boards	EX-377 (SONY part No. J-6269-810-A) EX-555 (SONY part No. A-8277-211-A) EX-556 (SONY part No. A-8277-212-A)	DM-89, EQ-56, TBC-23 VPR-17 APR-12
Extension harness	14P (SONY part No. 1-952-684-11)	TBC-24
Composite video monitor	For 625/50 (PAL) system  For 525/60 (NTSC) system	APR-12, DM-89, EQ-56, TBC-23/24, VPR-17  VPR-17 (Note)
Terminators	75 Ω, BNC	DM-89, TBC-23/24, VPR-17
BNC T adapter	75 Ω	VPR-17
Cleaning tape	BCT-5CLN (SONY standard products)	DM-89, TBC-23/24
Alignment tapes	CR5-1B PS (SONY part No. 8-960-096-91) CR5-2A PS (SONY part No. 8-960-098-44) CR8-1A PS (SONY part No. 8-960-098-45) CR8-1B PS (SONY part No. 8-960-096-86) SR5-1P (SONY part No. 8-960-075-51)	DM-89, EQ-56, TBC-23/24 DM-89, EQ-56, TBC-23/24 APR-12 APR-12 EQ-56, VPR-17
Setting clips		APR-12, DM-89

**Note**

If the DNW-A22P is operated on the 525/60 line system, the adjustments for the 525/60 line system are required at the electrical adjustments after the VPR-17 board replacement. In this time, the composite video monitor for 525/60 line system is required to display the maintenance mode screen.

## 6-1-5. Content of Alignment Tapes

Describes the contents of alignment tapes to be appeared in Section 6.

CR5-1B (SONY part No. 8-960-096-41): For DNW-A22 only  
 CR5-1B PS (SONY part No. 8-960-096-91): For DNW-A22P only

Time (min. : sec.)	Video	AFM*	LAU tracks	CTL track
0:00 -	RF sweep	No signal	No signal	CTL
2:00 -	60% H sweep (CTDM)	No signal	No signal	CTL
5:00 -	Pulse & Bar (CTDM)	No signal	No signal	CTL
8:00 -	60% multi-burst	No signal	No signal	CTL
11:00 -	Pulse & Bar	No signal	No signal	CTL
14:00 -	CR5-1B: 75% color-bar CR5-1B PS: 100% color-bar	400 kHz sine wave with 25 kHz deviation	No signal	CTL
16:30 -	CR5-1B: 75% color-bar CR5-1B PS: 100% color-bar	400 kHz sine wave with 75 kHz deviation	No signal	CTL
17:00 -	CR5-1B: 50% bowtie & 12.5T CR5-1B PS: 50% bowtie & 10T	No signal	No signal	CTL
19:00 -	Line 17	No signal	No signal	CTL
22:00 -	Quad phase	No signal	No signal	CTL
24:00 -	Flat filed	No signal	No signal	CTL
26:00 -	CR5-1B: 75% color-bar with Drop-out CR5-1B PS: 100% color-bar with Drop-out	No signal	No signal	CTL
28:00 - 30:00	Composite V sweep with VISC	No signal	No signal	CTL

\*: DNW can not playback AFM part.

CR5-2A (SONY part No. 8-960-097-44): For DNW-A22 only  
 CR5-2A PS (SONY part No. 8-960-098-44): For DNW-A22P only

Time (min. : sec.)	Video	LAU tracks	CTL track
0:00 -	75% color-bar	No signal	CTL
3:00 -	60% multi-burst	No signal	CTL
6:00 -	CR5-2A: 50% bowtie & 12.5T CR5-2A PS: 50% bowtie & 10T	No signal	CTL
9:00 -	Pulse & Bar	No signal	CTL
11:00 -	Quad phase	No signal	CTL
13:00 - 15:00	Composite monoscope (Switching position is shifted.)	No signal	CTL

CR8-1A (SONY part No. 8-960-097-45): For DNW-A22 only  
 CR8-1A PS (SONY part No. 8-960-098-45): For DNW-A22P only

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal
2:55 -	No signal	CTL	No signal
3:00 -	10 kHz sine wave, -10 VU	CTL	No signal
4:55 -	No signal	CTL	No signal
5:00 -	1 kHz sine wave, -20 VU	CTL	No signal
5:55 -	No signal	CTL	No signal
6:00 -	40 Hz sine wave, -20 VU	CTL	No signal
6:25 -	No signal	CTL	No signal
6:30 -	7 kHz sine wave, -20 VU	CTL	No signal
6:55 -	No signal	CTL	No signal
7:00 -	10 kHz sine wave, -20 VU	CTL	No signal
7:25 -	No signal	CTL	No signal
7:30 -	15 kHz sine wave, -20 VU	CTL	No signal
7:55 -	No signal	CTL	No signal
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sine wave, 0VU	No signal

CR8-1B PS (SONY part No. 8-960-096-86): For DNW-A22P only

Time (min. : sec.)	LAU tracks	CTL track	Video	AFM
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal	No signal
2:55 -	No signal	CTL	No signal	No signal
3:00 -	15 kHz sine wave, 0 VU	CTL	No signal	No signal
4:55 -	No signal	CTL	No signal	No signal
5:00 -	1 kHz sine wave, -20 VU	CTL	No signal	No signal
5:55 -	No signal	CTL	No signal	No signal
6:00 -	40 Hz sine wave, -20 VU	CTL	No signal	No signal
6:25 -	No signal	CTL	No signal	No signal
6:30 -	7 kHz sine wave, -20 VU	CTL	No signal	No signal
6:55 -	No signal	CTL	No signal	No signal
7:00 -	10 kHz sine wave, -20 VU	CTL	No signal	No signal
7:25 -	No signal	CTL	No signal	No signal
7:30 -	15 kHz sine wave, -20 VU	CTL	No signal	No signal
7:55 - 8:00	No signal	CTL	No signal	No signal

SR5-1 (SONY part No. 8-960-075-01): For DNW-A22

SR5-1P (SONY part No. 8-960-075-51): For DNW-A22P

Time (min. : sec.)	Digital video	Digital audio	CTL track
0:00 -	100% color-bar	1 kHz sine wave, -20 dB FS	CTL
2:00 -	100% color-bar	1 kHz sine wave, 0 dB FS	CTL
4:00 -	100% color-bar	-∞ dB FS	CTL
6:00 -	100% color-bar	20 Hz sine wave, -20 dB FS	CTL
8:00 -	100% color-bar	20 kHz sine wave, -20 dB FS	CTL
10:00 -	Ramp	1 kHz sine wave, -20 dB FS	CTL
12:00 -	Ramp	1 kHz sine wave, 0 dB FS	CTL
14:00 -	Ramp	-∞ dB FS	CTL
16:00 -	Ramp	20 Hz sine wave, -20 dB FS	CTL
18:00 -	Ramp	20 kHz sine wave, -20 dB FS	CTL
20:00 -	100% color-bar	1 kHz sine wave, -20 dB FS	CTL
22:00 -	100% color-bar	1 kHz sine wave, 0 dB FS	CTL
24:00 -	100% color-bar	-∞ dB FS	CTL
26:00 -	100% color-bar	20 Hz sine wave, -20 dB FS	CTL
28:00 - 30:00	100% color-bar	20 kHz sine wave, -20 dB FS	CTL

## 6-2. APR-12 Board Replacement

The electrical adjustments are essential after the APR-12 board for DNW-A22/A22P is replaced. To perform the electrical adjustments, the following equipment and fixtures are required.

- Audio analyzer: TEKTRONIX AA501A-option 02 or equivalent
 

**Note**

Always, the audio analyzer should be filtered through 80 kHz LPF.
- Audio level meter: HEWLETT-PACKARD HP3400A or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Extension board: EX-556 (SONY part No. A-8277-212A)
- Alignment tape(s)
  - For DNW-A22: CR8-1A (SONY part No. 8-960-097-45)
  - For DNW-A22P: CR8-1A PS (SONY part No. 8-960-098-45) and  
CR8-1B PS (SONY part No. 8-960-096-86)
- Shorting clips

### 6-2-1. Replacement Procedure

**Note**

Turn off the POWER switch before starting the replacement.

- (1) Remove the upper lid, board retainer (S), and APR-12 (original) board.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”. )
- (2) Disconnect the two harnesses from CN500 and CN600 on the APR-12 (original) board.
- (3) After inserting the extension board EX-556 to the slot for APR-12 board, and then connect a new APR-12 board to the extension board.
- (4) Connect the two disconnected harnesses to CN500(red) and CN600(yellow) on the APR-12 (new) board.
- (5) Clean the AT head. (Refer to “5-2-5. Stationary Heads Cleaning”. )
- (6) Perform the electrical adjustments (Section 6-2-3).
- (7) For DNW-A22P only  
Return the ITEM-F01: AUDIO NR IN SP MODE of setup extend menu to “ON”.
- (8) Return the states of S1100-1 on the SS-63 board, control panels, and connector panel to their original states.
- (9) Turn off the power, and wait for 30 seconds.
- (10) Remove the adjusted APR-12 board from the extension board, then pull out the extension board.

**Note**

It is not necessary to disconnect the harnesses that are connected to the adjusted APR-12 board.

- (11) Set the short plugs on the adjusted APR-12 board to the same settings as the original board.  
(For shorting plugs, refer to Section 1-10-1. )
- (12) Install the board retainer (S) and upper lid after inserting the adjusted APR-12 board.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”. )

## 6-2-2. Electrical Adjustments

### Adjustment Items

No.	Item	Adjustment point	Notes
0	Preparation		
1	Offset level adjustment	CH1 ◎RV103/APR-12(D-2)	TP700/APR-12(G-3)
		CH2 ◎RV203/APR-12(G-2)	TP700/APR-12(G-3)
2	LAU PB frequency response adjustment (OXIDE) (Audio head dumping adjustment)	CH1 ◎RV501/APR-12(A-1) ◎RV500/APR-12(A-1) [S500/APR-12(A-1)]	AUDIO OUTPUT CH1
		CH2 ◎RV601/APR-12(G-1) ◎RV600/APR-12(G-1) [S600/APR-12(G-1)]	AUDIO OUTPUT CH2
3	LAU PB frequency response adjustment (METAL) (DNW-A22P only)	CH1 ◎RV502/APR-12(A-1)	AUDIO OUTPUT CH
		CH2 ◎RV602/APR-12(G-1)	AUDIO OUTPUT CH2
4	LAU Dolby level adjustment	CH1 ◎RV503/APR-12(C-1)	TP501/APR-12(C-1)
		CH2 ◎RV604/APR-12(E-1)	TP601/APR-12(E-1)
5	LAU PB level adjustment	CH1 ◎RV504/APR-12(B-1)	AUDIO OUTPUT CH1
		CH2 ◎RV605/APR-12(F-1)	AUDIO OUTPUT CH2
6	LAU PB phase adjustment	◎RV603/APR-12(F-1)	AUDIO OUTPUT CH1/CH2

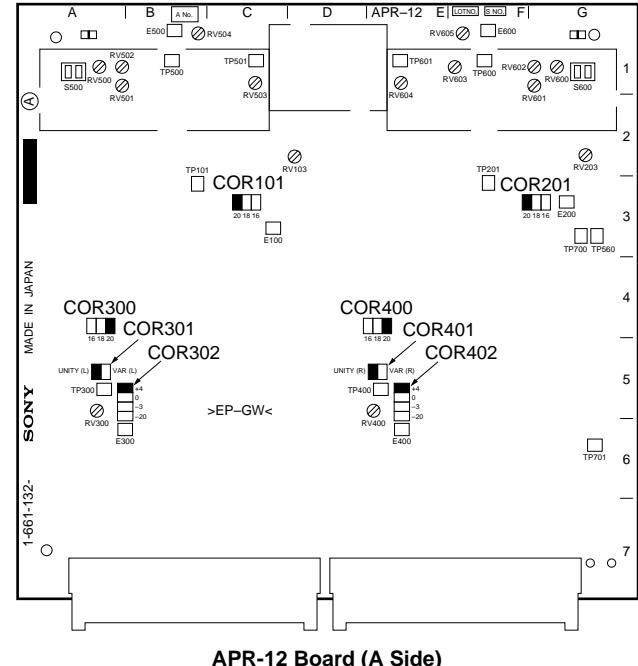
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## 0. Preparation

### Setting(Check) of the short plugs on the APR-12 board

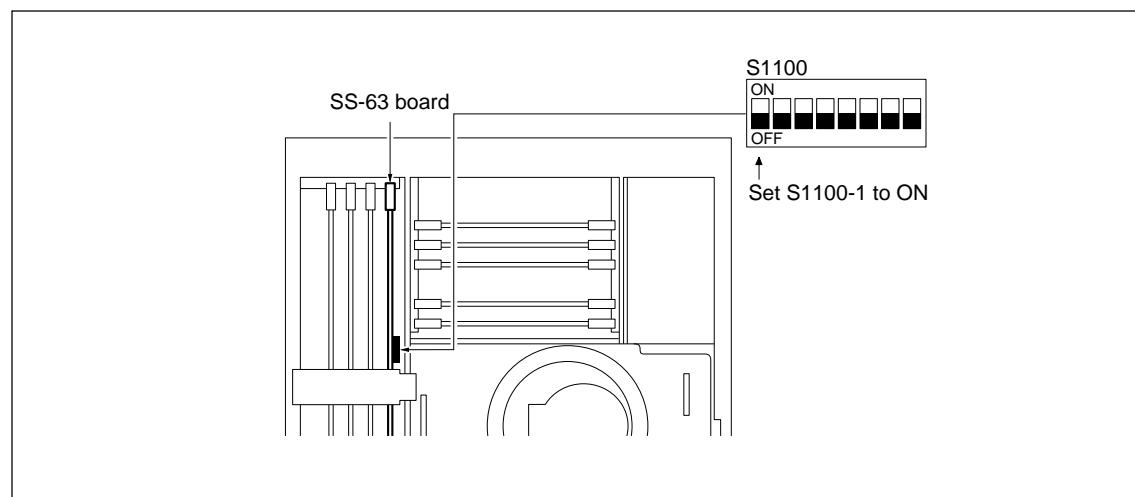
Set the position of short plugs as follows:

Ref. No.	Item	Position
COR101	Analog audio CH1 input headroom	20
COR201	Analog audio CH2 input headroom	20
COR300	Monitor L output headroom	20
COR301	Monitor L output level, fixed or variable	UNITY(L)
COR302	Monitor L output level	+4
COR400	Monitor R output headroom	20
COR401	Monitor R output level, fixed or variable	UNITY(R)
COR402	Monitor R output level	+4

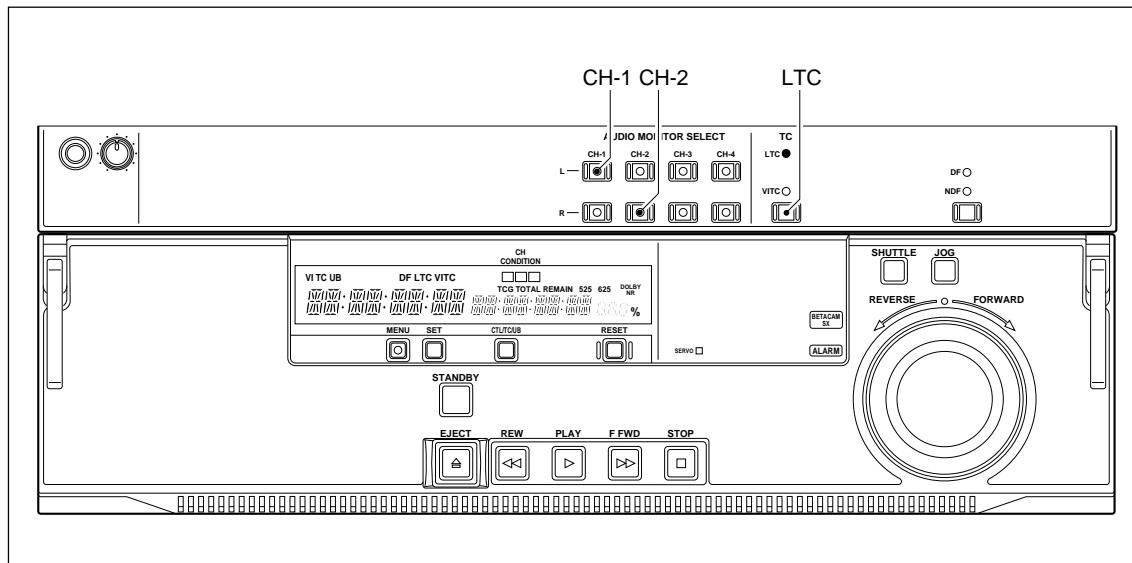


### Setting of the DNW

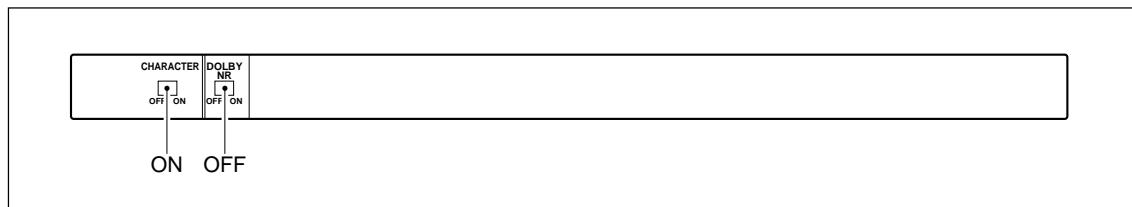
- (1) Set S1100-1 on SS-63 board to ON to treat the extended menu of the setup menu.



- (2) Turn on the power, and set each control panel and connector panel as shown below.



**Upper/Lower Control Panels**



**Sub Control Panel**

### Setting of the setup extend menu

- For the DNW-A22

None.

- For the DNW-A22P

Set the ITEM-F01: AUDIO NR IN SP MODE to “SW”.

**Notes**

- To display the ITEM-F00 series, turn the search dial while pressing the PLAY button.
- After adjustments are completed, return the ITEM-F01 to “ON”.

## 1. Offset Level Adjustment

Measuring equipment: Oscilloscope

**Note**

More than 20 minutes should elapse after turning the power on, when this adjustment is performed.

- (1) Short-circuit TP101/APR-12(B-3) and E100/APR-12(C-3) with a shorting clip.
- (2) Short-circuit TP201/APR-12(F-3) and E200/APR-12(G-3) with a shorting clip.
- (3) Connect and set the oscilloscope as follows:  
 CH-1: TP700/APR-12(G-3), DC 5 V/DIV, 2  $\mu$ s/DIV  
 CH-2: TP701/APR-12(G-6), DC 5 V/DIV  
 Trigger: CH-2, – slope
- (4) Adjust  $\bullet$ RV103/APR-12(D-2) so that the audio CH1 part of the waveform at TP700 makes the same waveform to the Figure 1 (left side).
- (5) Adjust  $\bullet$ RV203/APR-12(G-2) so that the audio CH2 part of the waveform at TP700 makes the same waveform to the Figure 1 (right side).

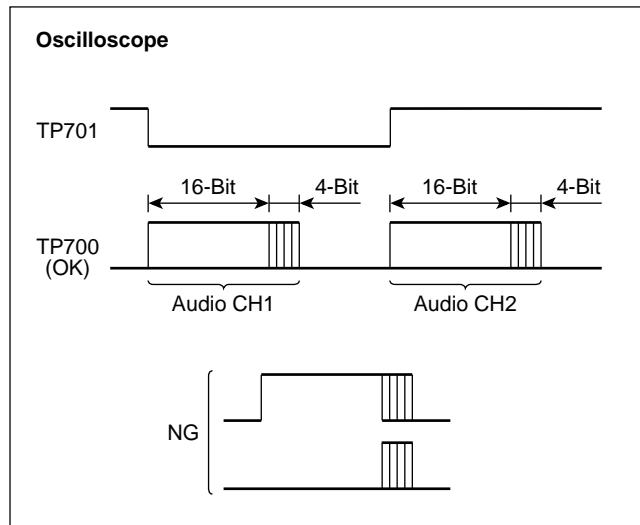
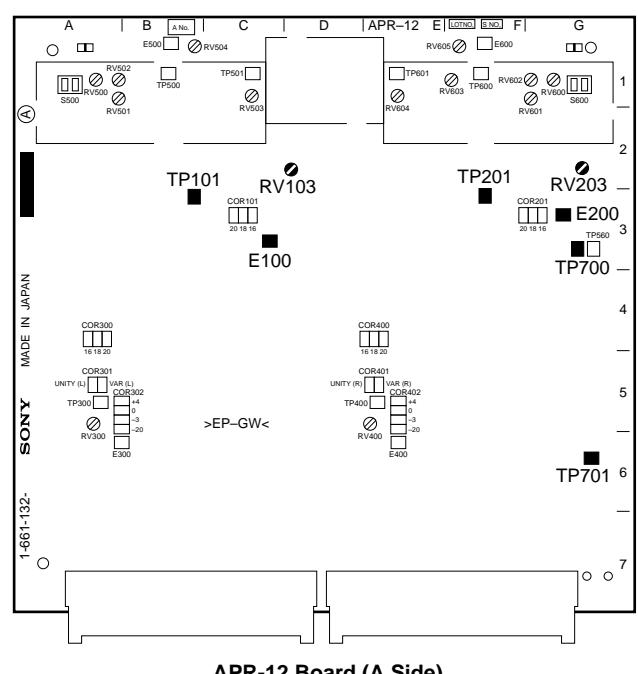


Figure 1. Waveform of CH1/CH2 Offset Level Adjustment

- (6) Disconnect the shorting clips from TP101, TP102, E100, and E200.



APR-12 Board (A Side)

## 2. LAU PB Frequency Response Adjustment (OXIDE)

Measuring equipment: Audio analyzer

### CH1 adjustment

- (1) Connect the input of audio analyzer to MONITOR OUTPUT L connector.
- (2) Playback the following specified portions (-20 VU) of the alignment tape CR8-1A or CR8-1A PS, and perform the adjustments and checks. (DNW-A22: CR8-1A, DNW-A22P: CR8-1A PS)

Playback portion	Specifications[dB]		Adjustment point
	DNW-A22	DNW-A22P	
5:00 to 5:55 (1 kHz, -20 VU)	Measured value makes 0 dB (reference).	Measured value makes 0 dB (reference).	-
6:00 to 6:25 (40 Hz, -20 VU)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, -20 VU)	C.V. $\pm 0.3$	C.V. $\pm 0.4$	RV501/APR-12(A-1)
7:00 to 7:25 (10 kHz, -20 VU)	C.V. $\pm 0.3$	C.V. $\pm 0.4$	(Check only)
7:30 to 7:55 (15 kHz, -20 VU)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{-1.0}_{-1.7}$	RV500/APR-12(A-1)

**Note**

The each correction values (C.V.) are recorded on the label of the alignment tape.

If the specifications are not met, switch S500/APR-12(A-1) and adjust again.

### CH2 adjustment

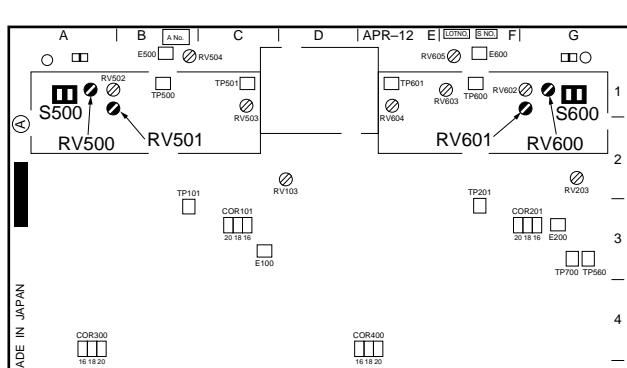
- (1) Connect the input of audio analyzer to MONITOR OUTPUT R connector.
- (2) Playback the following specified portions (-20 VU) of the alignment tape CR8-1A or CR8-1A PS, and perform the adjustments and checks. (DNW-A22: CR8-1A, DNW-A22P: CR8-1A PS)

Playback portion	Specifications[dB]		Adjustment point
	DNW-A22	DNW-A22P	
5:00 to 5:55 (1 kHz, -20 VU)	Measured value makes 0 dB (reference).	Measured value makes 0 dB (reference).	-
6:00 to 6:25 (40 Hz, -20 VU)	C.V. $^{+0.7}_{-1.7}$	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, -20 VU)	C.V. $\pm 0.3$	C.V. $\pm 0.4$	RV601/APR-12(G-1)
7:00 to 7:25 (10 kHz, -20 VU)	C.V. $\pm 0.3$	C.V. $\pm 0.4$	(Check only)
7:30 to 7:55 (15 kHz, -20 VU)	C.V. $^{+0.3}_{-1.0}$	C.V. $^{-1.0}_{-1.7}$	RV600/APR-12(G-1)

**Note**

The each correction values (C.V.) are recorded on the label of the alignment tape.

If the specifications are not met, switch S600/APR-12(G-1) and adjust again.



APR-12 Board (A Side)

### 3. LAU PB Frequency Response Adjustment (METAL)

**Note**

Perform this adjustment for only DNW-A22P.

Measuring equipment: Audio analyzer

#### CH1 adjustment

- (1) Connect the input of audio analyzer to MONITOR OUTPUT L connector.
- (2) Playback the following specified portions (-20 VU) of alignment tape CR8-1A PS, and perform the adjustment and checks.

Play back portion	Specifications[dB]	Adjustment point
5:00 to 5:55 (1 kHz, -20 VU)	Measured value makes 0 dB (reference).	-
6:00 to 6:25 (40 Hz, -20 VU)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, -20 VU)	C.V. $\pm 0.3$	(Check only)
7:00 to 7:25 (10 kHz, -20 VU)	C.V. $\pm 0.4$	(Check only)
7:30 to 7:55 (15 kHz, -20 VU)	C.V. $\pm 0.5$	•RV502/APR-12(A-1)

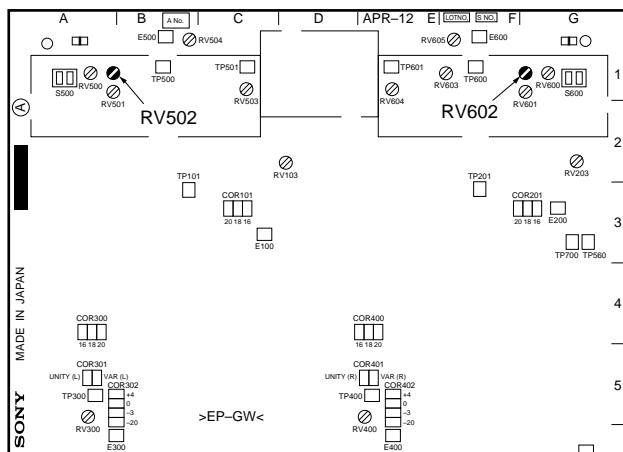
The each correction values (C.V.) are recorded on the label of the alignment tape.

#### CH2 adjustment

- (1) Connect the input of audio analyzer to MONITOR OUTPUT R connector.
- (2) Playback the following specified portions (-20 VU) of alignment tape CR8-1A PS, and perform the adjustment and checks.

Play back portion	Specifications[dB]	Adjustment part
5:00 to 5:55 (1 kHz, -20 VU)	Measured value makes 0 dB (reference).	-
6:00 to 6:25 (40 Hz, -20 VU)	C.V. $^{+0.7}_{-1.7}$	(Check only)
6:30 to 6:55 (7 kHz, -20 VU)	C.V. $\pm 0.3$	(Check only)
7:00 to 7:25 (10 kHz, -20 VU)	C.V. $\pm 0.4$	(Check only)
7:30 to 7:55 (15 kHz, -20 VU)	C.V. $\pm 0.5$	•RV602/APR-12(G-1)

The each correction values (C.V.) are recorded on the label of the alignment tape.



APR-12 Board (A Side)

#### 4. LAU Dolby Level Adjustment

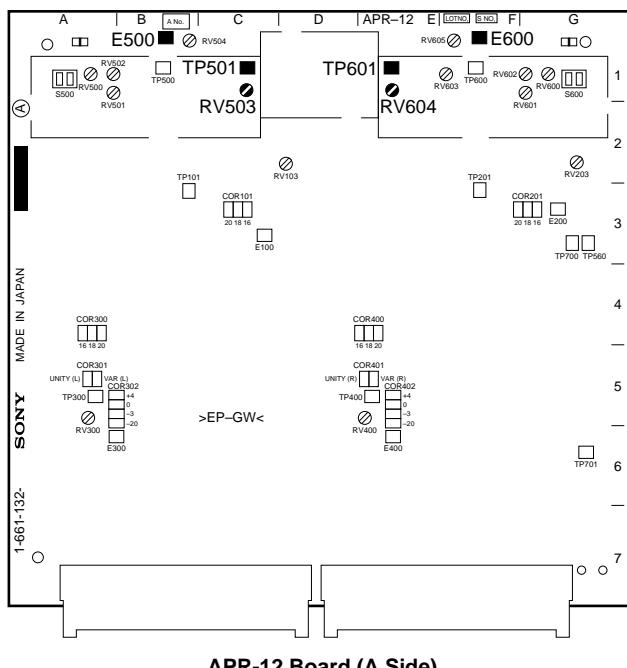
Measuring equipment: Audio level meter

##### CH1 adjustment

- (1) Connect the audio level meter to TP501/APR-12(C-1).  
GND : E500/APR-12(B-1)
- (2) Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.  
(DNW-A22: CR8-1A, DNW-A22P: CR8-1B PS)  
Adjustment point: **●RV503/APR-12(C-1)**  
Specification:  $-10.0 \pm 0.1$  dBu

##### CH2 adjustment

- (1) Connect the audio level meter to TP601/APR-12(E-1).  
GND : E600/APR-12(F-1)
- (2) Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.  
(DNW-A22: CR8-1A, DNW-A22P: CR8-1B PS)  
Adjustment point: **●RV604/APR-12(E-1)**  
Specification:  $-10.0 \pm 0.1$  dBu



## 5. LAU PB Level Adjustment

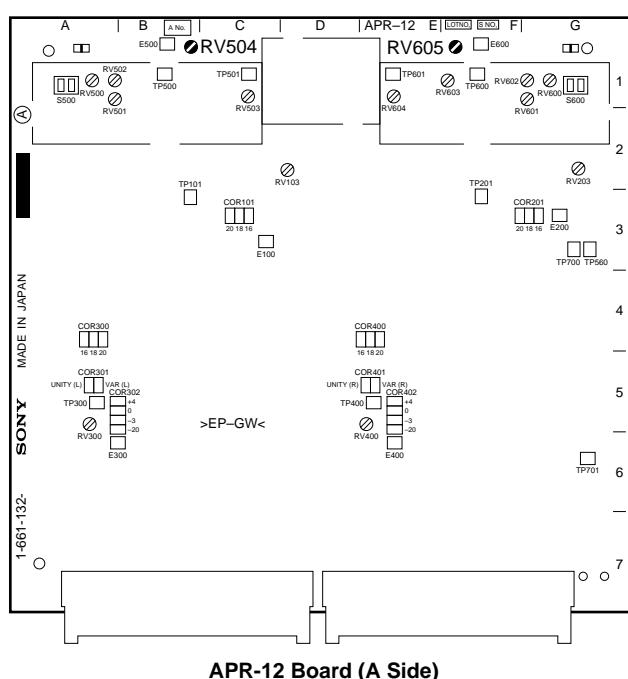
Measuring equipment: Audio analyzer (terminated with  $600\ \Omega$ )

### CH1 adjustment

- (1) Connect the input of audio analyzer to MONITOR OUTPUT L connector.
  - (2) Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.  
(DNW-A22: CR8-1A, DNW-A22P: CR8-1B PS)
- Adjustment point: **RV504/APR-12(B-1)**  
Specification:  $+4.0 \pm 0.1\ \text{dBu}$

### CH2 adjustment

- (1) Connect the input of audio analyzer to MONITOR OUTPUT R connector.
  - (2) Playback the 1 kHz, 0 VU portion (0:00 to 2:55) of alignment tape CR8-1A or CR8-1B PS, and perform the level adjustment.  
(DNW-A22: CR8-1A, DNW-A22P: CR8-1B PS)
- Adjustment point: **RV605/APR-12(F-1)**  
Specification:  $+4.0 \pm 0.1\ \text{dBu}$



APR-12 Board (A Side)

## 6. LAU PB Phase Adjustment

Measuring equipment: Oscilloscope (X-Y mode)

- (1) Connect and set the oscilloscope as follows:

CH-1: Pin 2 (X) of MONITOR OUTPUT L connector [GND: Pin 1(G)], AC

CH-2: Pin 2 (X) of MONITOR OUTPUT R connector [GND: Pin 1(G)], AC

**Note**

Instead of the above connectors, following connection is acceptable.

Connect the two XLR-to-pigtail cables to the above mentioned connectors, and then connect the CH-1 and CH-2 of oscilloscope to each pigtail. Two XLR-to-pigtail cables should be the same length and same wire color.

- (2) For the DNW-A22, playback the 10 kHz, -10 VU portion (3:00 to 4:55) of the alignment tape CR8-1A.

For the DNW-A22P, playback the 15 kHz, 0 VU portion (3:00 to 4:55) of the alignment tape CR8-1B PS.

- (3) Observe the lissajous waveform on the oscilloscope.

- (4) Align the vertical and horizontal amplitudes of lissajous waveform to 60 mm square with the VOLTS/DIV and VAR controls of the oscilloscope.

- (5) Minimize the gap A of lissajous waveform.

Adjustment point: **RV603/APR-12(F-1)**

Specification:  $A \leq 5.2$  mm (Refer to Figure 2.)

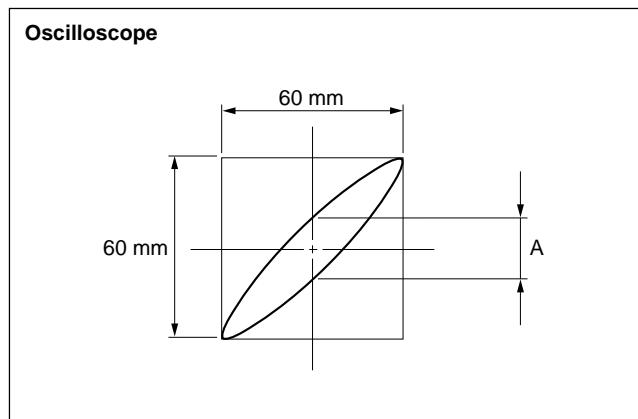
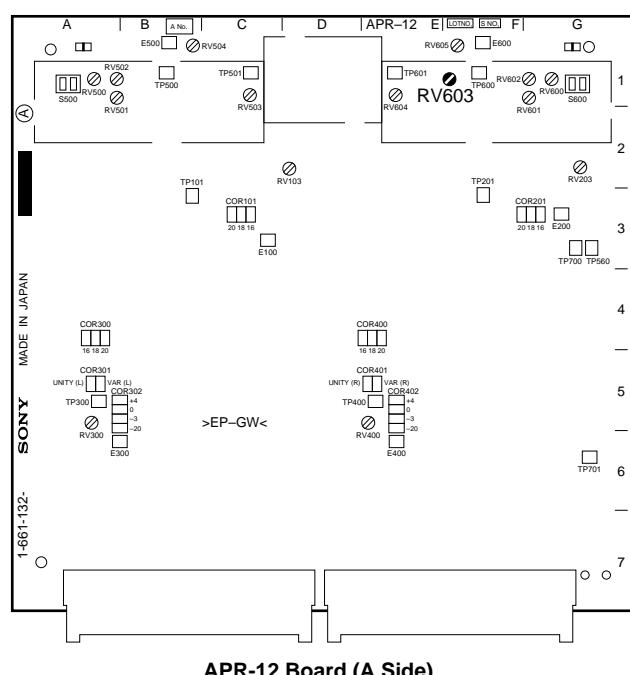


Figure 2. Waveform of LAU PB Phase Adjustment



## 6-3. DM-89 Board Replacement

The electrical adjustments are essential after the DM-89 board is replaced.

To perform the electrical adjustments, the following equipment and fixtures are required.

**Note**

The DM-89 board of the service parts code suffix-A cannot be used to DNW-A22/A22P. Some setting data are different according to the board number suffix (XX of 1-648-541-XX) of DM-89 board.

Be sure to confirm the suffixes of service parts code and board number before replacement. The service parts code is indicated on near the top right corner (G-1) of A side of DM-89 board, and the board number is indicated on the left margin (A-6) of A side.

- Composite waveform/vector monitor
  - For DNW-A22: TEKTRONIX 1750 or 1780R or equivalent
  - For DNW-A22P: TEKTRONIX 1751 or 1781R or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Spectrum analyzer: ADVANTEST R3261A or equivalent
- Network analyzer: ANRITSU MS420B or equivalent
- Digital voltage meter: ADVANTEST TR6845 or equivalent
- Composite video monitor
- Extension board: EX-377 (SONY part No. J-6269-810-A)
- 75 Ω terminators
- Cleaning tape: BCT-5CLN (SONY standard products)
- Alignment tapes
  - For DNW-A22: CR5-1B (SONY part No. 8-960-096-41) and CR5-2A (SONY part No. 8-960-097-44)
  - For DNW-A22P: CR5-1B PS (SONY part No. 8-960-096-91) and CR5-2A PS (SONY part No. 8-960-098-44)

### 6-3-1. Replacement Procedure

**Note**

Turn off the POWER switch before starting the replacement.

- (1) Remove the upper lid, board retainer (S), and DM-89 (original) board.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”.)
- (2) After inserting the extension board EX-377 to the slot for DM-89 board, and then connect a new DM-89 board to the extension board.
- (3) Clean the video heads once. (Refer to “5-2-1. Cleaning by Cleaning Tape”.)
- (4) Perform the electrical adjustments (Section 6-4-2).
- (5) For DNW-A22 only  
Return the ITEM-709 and ITEM-713 of setup extend menu to previous settings after the electrical adjustments are completed.
- (6) Return the states of S1100-1 on the SS-63 board and control panels to their previous states.
- (7) Turn off the power.
- (8) Remove the adjusted DM-89 board from the extension board, then pull out the extension board.
- (9) Install the board retainer (S) and upper lid after inserting the adjusted DM-89 board.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”.)

### 6-3-2. Electrical Adjustments

#### Adjustment Items

No.	Item	Adjustment point	Notes
0	Preparation		
1	Initial data setting	All data of A3 : BETACAM PB ADJUST	
2	EQ RF output level adjustment		
	METAL Y	A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B	TP100/DM-89
	METAL C	A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B	TP300/DM-89
	OXIDE C	A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B	TP300/DM-89
	OXIDE Y	A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B	TP100/DM-89
	Data save	A3F : NV-RAM CONTROL	
3	Cosine equalizer adjustment		
	METAL Y	Group delay <del>ORV101/DM-89, ORV102/DM-89</del> Main Sub	TP104/DM-89 TP3/DM-89 DNW-A22: Set the data to AF DNW-A22P: TP2/DM-89
	METAL C	Group delay <del>ORV301/DM-89, ORV302/DM-89</del> Main Sub	TP304/DM-89 TP7/DM-89 DNW-A22: Set the data to 70 DNW-A22P: TP6/DM-89
	OXIDE C	Group delay <del>ORV303/DM-89, ORV304/DM-89</del> Main Sub	TP304/DM-89 TP7/DM-89 TP6/DM-89
	OXIDE Y	Group delay <del>ORV104/DM-89, ORV103/DM-89</del> (RV103 is not equipped with the DM-89 board of the LOT Nos. 407 and higher.) Main Sub	TP104/DM-89 Set the data to E4 TP3/DM-89 TP2/DM-89
	OMC DC offset	A35 : DM VR 4 : OMC DC METAL-Y A35 : DM VR 4 : OMC DC METAL-C A35 : DM VR 4 : OMC DC OXIDE-Y A35 : DM VR 4 : OMC DC OXIDE-C	Set the data to D0
	Data Save	A3F : NV-RAM CONTROL	
4	Cosine equalizer provisional adjustment		
	<b>Note</b>	This provisional adjustment explains how to adjust without using the network analyzer as opposed to adjustment (No. 3) using the network analyzer. Do not perform this provisional adjustment except an urgent maintenance and the network analyzer is not available. If this provisional adjustment is done, it is recommended to perform the adjustment (No. 3) using the network analyzer later.	

(Continued)

No.	Item	Adjustment point	Notes
5	DM RF output level rough adjustment		
	METAL Y	ORV211/DM-89	TP3/DM-89
	METAL C	ORV406/DM-89	TP7/DM-89
	OXIDE C	ORV407/DM-89	TP7/DM-89
	OXIDE Y	ORV212/DM-89	TP3/DM-89
6	OMC carrier balance adjustment		
	OXIDE Y	ORV107/DM-89, ORV108/DM-89	TP105/DM-89
	OXIDE C	ORV307/DM-89, ORV308/DM-89	TP305/DM-89
	METAL C	ORV305/DM-89, ORV306/DM-89	TP305/DM-89
	METAL Y	ORV105/DM-89, ORV106/DM-89	TP105/DM-89
7	OMC carrier balance provisional adjustment		
	<b>Note</b>		
	This provisional adjustment explains how to adjust without using the spectrum analyzer as opposed to adjustment (No. 6) using the spectrum analyzer.		
	Do not perform this provisional adjustment except an urgent maintenance and the spectrum analyzer is not available. If this provisional adjustment is done, it is recommended to perform the adjustment (No. 6) using the spectrum analyzer later.		
8	Demodulator limiter balance adjustment		
	Y	ORV502/DM-89	TP501/DM-89
	C	ORV702/DM-89	TP8/DM-89
9	Non-liner output level adjustment		
	METAL Y	ORV503/DM-89	TP505/DM-89
	METAL C	ORV703/DM-89	TP705/DM-89 (For DNW-A22P)
	C	ORV704/DM-89	TP705/DM-89 (For DNW-A22)
	OXIDE C	ORV704/DM-89	TP705/DM-89 (DNW-A22P only)
	OXIDE Y	ORV504/DM-89	TP505/DM-89
10	PB frequency response adjustment		
	METAL Y	A32 : DM VR 1 : EQ1 METAL-Y-A A32 : DM VR 1 : EQ1 METAL-Y-B	VIDEO OUTPUT COMPOSITE 1
	METAL C	A32 : DM VR 1 : EQ1 METAL-C-A A32 : DM VR 1 : EQ1 METAL-C-B	TP8/DM-89
	OXIDE Y	A32 : DM VR 1 : EQ1 OXIDE-Y-A A32 : DM VR 1 : EQ1 OXIDE-Y-B	VIDEO OUTPUT COMPOSITE 1
	OXIDE C	A32 : DM VR 1 : EQ1 OXIDE-C-A A32 : DM VR 1 : EQ1 OXIDE-C-B	TP8/DM-89
	Data save	A3F : NV-RAM CONTROL	
11	Drop-out compensation equalizer adjustment		
	METAL Y	ORV201/DM-89	TP203/DM-89
	METAL C	ORV401/DM-89	TP403/DM-89
	OXIDE Y	ORV202/DM-89	RV202/DM-89
	OXIDE C	ORV402/DM-89	RV402/DM-89
12	DM RF output level adjustment		
	METAL Y	ORV211/DM-89	TP3/DM-89
	METAL C	ORV406/DM-89	TP7/DM-89
	OXIDE C	ORV407/DM-89	TP7/DM-89
	OXIDE Y	ORV212/DM-89	TP3/DM-89

(Continued)

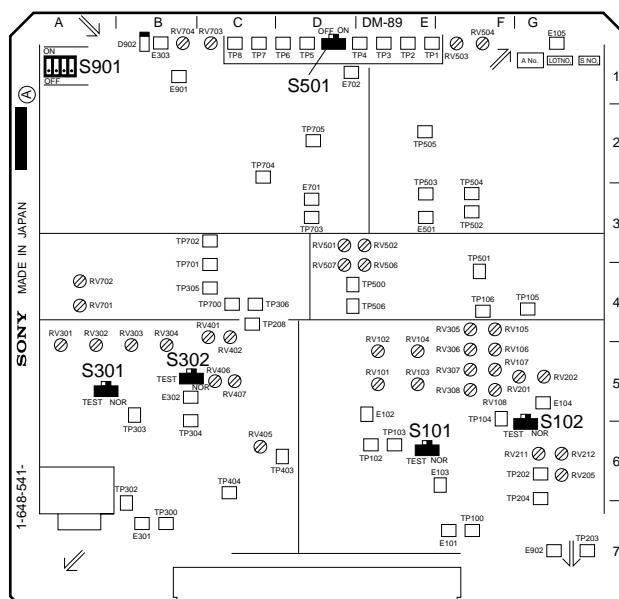
No.	Item	Adjustment point	Notes
13	RF envelope adjustment		
	Y	•RV205/DM-89	TP203/DM-89
	C	•RV405/DM-89	TP403/DM-89
	TH H level	A36 : DM VR 5 : ENV-TH-H	Set the data to 20
	TH L level	A36 : DM VR 5 : ENV-TH-L	Set the data to 10
	Data save	A3F : NV-RAM CONTROL	
14	DM search picture adjustment		
	Offset	•RV506/DM-89	TP500/DM-89
	Y	•RV501/DM-89	TP502/DM-89
	C	•RV701/DM-89	TP702/DM-89
	Gain	•RV507/DM-89	TP1/DM-89
15	Guard band width adjustment		
	METAL	A35 : DM VR 4 : GUARD BAND METAL-Y A35 : DM VR 4 : GUARD BAND METAL-C	
	OXIDE	A35 : DM VR 4 : GUARD BAND OXIDE-Y A35 : DM VR 4 : GUARD BAND OXIDE-C	
	Data save	A3F : NV-RAM CONTROL	
16	Video output level adjustment		
	METAL Y	•RV101/TBC-24	VIDEO OUTPUT COMPOSITE 1
	METAL C	•RV201/TBC-24	VIDEO OUTPUT COMPOSITE 1
	OXIDE Y	•RV504/DM-89	VIDEO OUTPUT COMPOSITE 1
	OXIDE C	•RV704/DM-89	VIDEO OUTPUT COMPOSITE 1 (DNW-A22P only)

## 0. Preparation

### Setting (Check) of the switches on the DM-89 board

Confirm that the switches are factory settings.

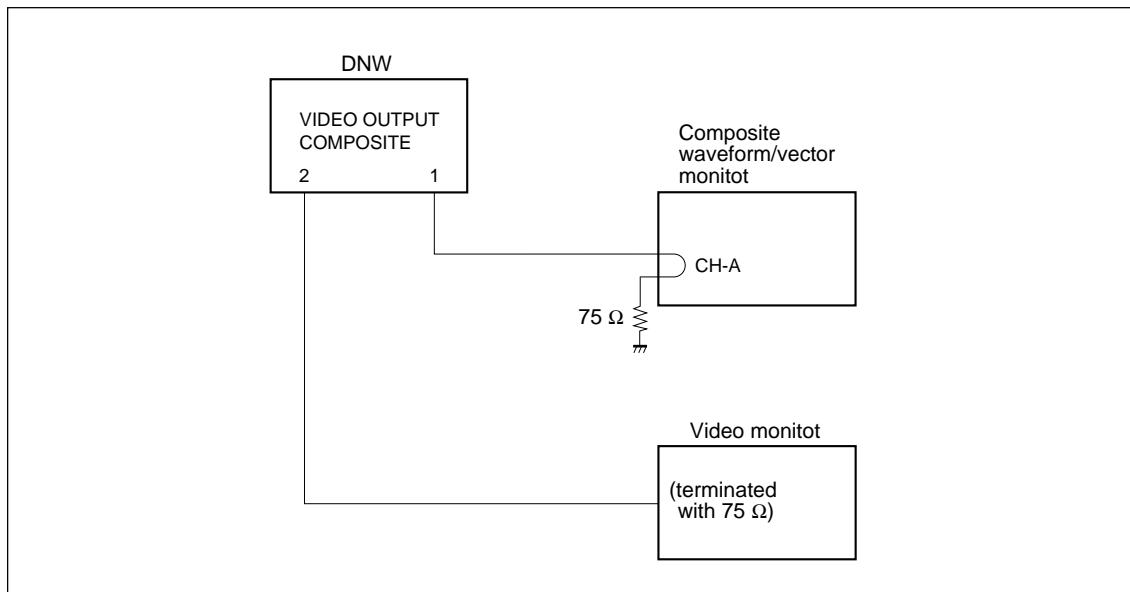
Ref. No.	Factory setting
S101	NORMAL POSITION (right side)
S102	NORMAL POSITION (right side)
S301	NORMAL POSITION (right side)
S302	NORMAL POSITION (right side)
S501	ON (right side)
S901	1 OFF (down side) 2 OFF (down side) 3 OFF (down side) 4 OFF (down side)



DM-89 Board (A Side)

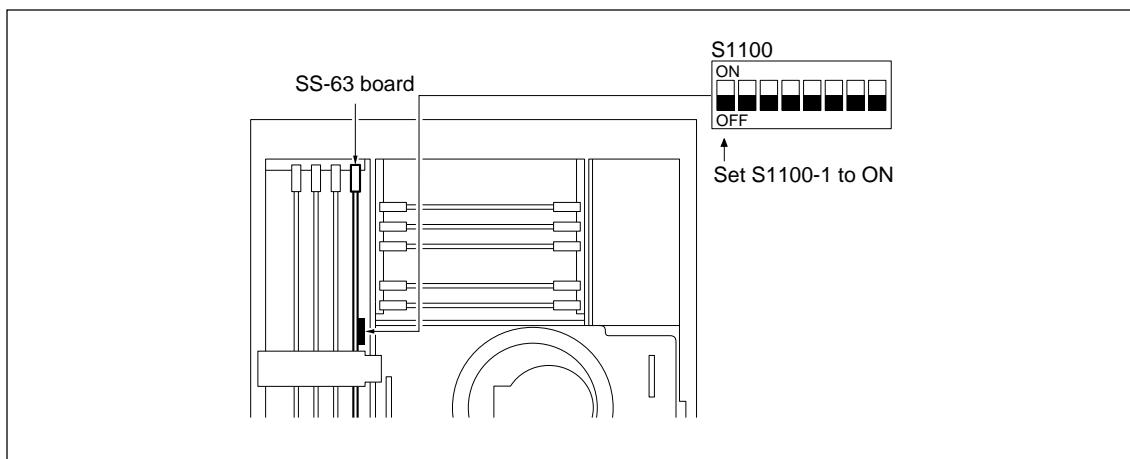
## Connection

Connect the compositewaveform monitor and video monitor as shown below.

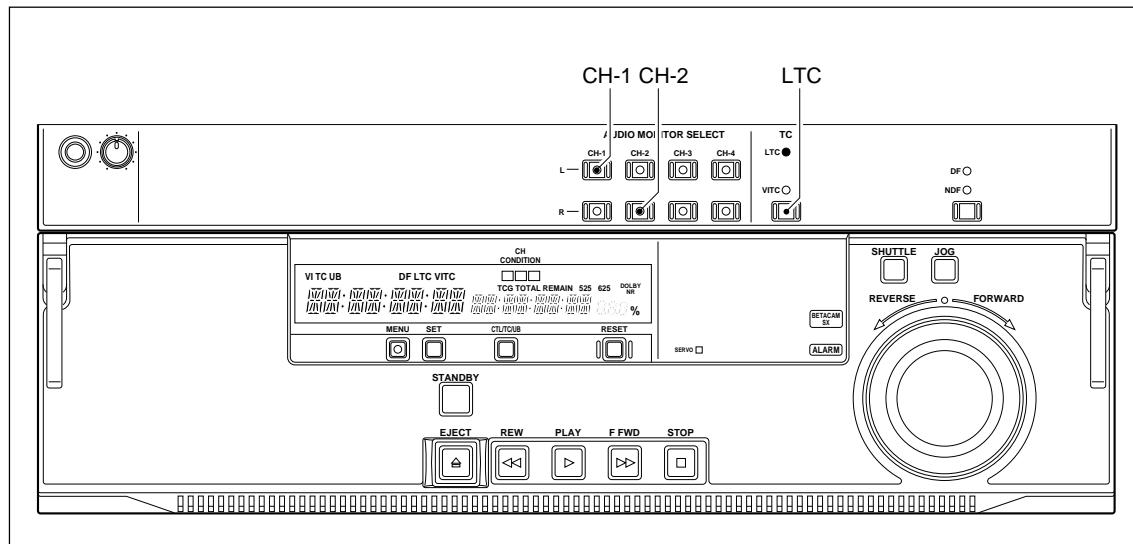


## Setting of DNW

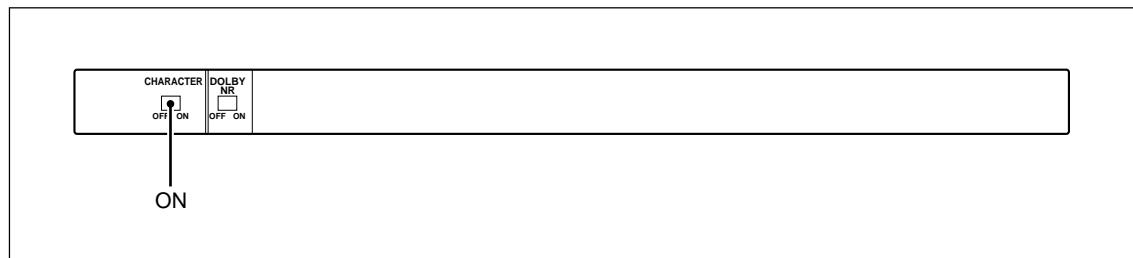
- (1) Set S1100-1 on SS-63 board to ON to treat the extended menu of the setup menu.



- (2) Turn on the power, and set each control panel as shown below.



**Upper/Lower Control Panels**



**Sub Control Panel**

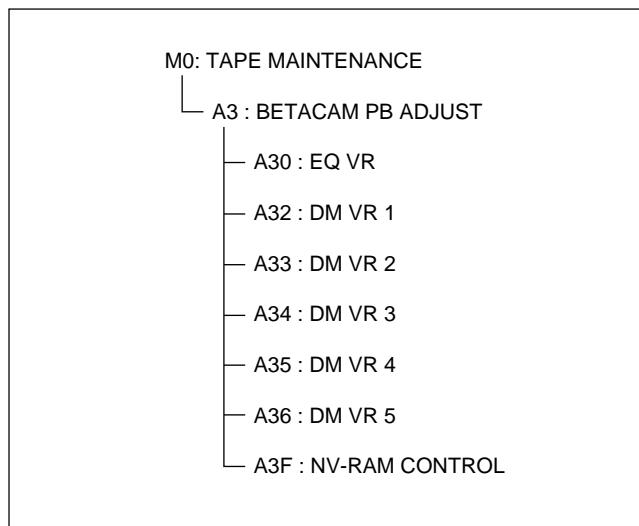
(3) Enter the maintenance mode

To enter the maintenance mode, push S1101 on the SS-63 board.

**Notes**

Describes the operation of the maintenance mode as follows:

The sub mode and menus of the maintenance mode that are used after replacing the DM-89 board are as shown below.



• **How to enter the next menu**

- (1) Push the JOG button once.  
= **Search dial enters into the JOG mode.**
- (2) To set the cursor (\* mark) to the desired menu (mode), turn the search dial.
- (3) Push the SET button once.

• **How to exit the current menu (mode)**

Push the MENU button once.

**Note**

If the MENU button is pushed several times, the maintenance mode exits.

• **How to change the data value**

- (1) To set the cursor (\* mark) to the item, turn the search dial.
- (2) Turn the search dial slowly while pressing the JOG button. = **Data value changes.**  
REVERSE direction: decrease the data value (00's next is FF)  
FORWARD direction: increase the data value (FF's next is 00)

**Note**

During adjustment, change the rotational direction of the search dial according to the change of waveform that is displayed on the measuring equipment.

• **How to save the data**

- (1) To set the cursor (\* mark) to A3F : NV-RAM CONTROL, turn the search dial.
- (2) Push the SET button once.
- (3) To set the cursor (\* mark) to “SAVE ALL ADJUST DATA”, turn the search dial.
- (4) Push the SET button once.

• **How to operate (playback, rewind, forward, etc.) the tape when DNW enters into the maintenance mode**

- (1) Enter any menu of A30 to A36.
- (2) To pause the maintenance mode operation, push the SET button. = **It enables tape operation.**

**Note**

Changes the time data display area on the lower control panel to normal operation mode (time code display), and displays the ■ mark to the top right corner of menu screen on the video monitor.

- (3) After the tape operation was completed, push the MENU button to cancel the pause of maintenance mode.

**Note**

Returns the displays of the time data display area and video monitor to their previous states.

## 1. Initial Data Setting

- (1) Enter A3 : BETACAM PB ADJUST of the maintenance mode.
- (2) Enter A30 : EQ VR.
- (3) Set the specified data to all items of A30 : EQ VR.  
(For setting data, refer to the table below.)
- (4) To exit A30 : EQ VR, push the MENU button once.
- (5) Enter A32 : DM VR 1.
- (6) Set the specified data to all items of A32 : DM VR 1.  
(For setting data, refer to the table below.)
- (7) To exit A32 : DM VR 1, push the MENU button once.
- (8) Enter A33 : DM VR 2.
- (9) Set the specified data to all items of A33 : DM VR 2.  
(For setting data, refer to the table below.)
- (10) To exit A33 : DM VR 2, push the MENU button once.

Item of A3 :BETACAM ADJUST	Setting data for DNW-A22	Setting data for DNW-A22P
A30 : EQ VR	RF GAIN METAL-Y-A	55
	RF GAIN METAL-Y-B	55
	RF GAIN METAL-C-A	3F
	RF GAIN METAL-C-B	3F
	RF GAIN OXIDE-Y-A	72
	RF GAIN OXIDE-Y-B	72
	RF GAIN OXIDE-C-A	5A
	RF GAIN OXIDE-C-B	5A
A32 : DM VR 1	EQ1 METAL-Y-A	79
	EQ1 METAL-Y-B	79
	EQ1 METAL-C-A	7C
	EQ1 METAL-C-B	7C
	EQ1 OXIDE-Y-A	A6
	EQ1 OXIDE-Y-B	A6
	EQ1 OXIDE-C-A	90
	EQ1 OXIDE-C-B	90
A33 : DM VR 2	MAIN METAL-Y-A	CD
	MAIN METAL-Y-B	CD
	MAIN METAL-C-A	8E
	MAIN METAL-C-B	8E
	MAIN OXIDE-Y-A	A6
	MAIN OXIDE-Y-B	A6
	MAIN OXIDE-C-A	9E
	MAIN OXIDE-C-B	9E

- (11) Enter A34 : DM VR 3.
- (12) Set the specified data to all items of A34 : DM VR 3.  
(For setting data, refer to the table below.)
- (13) To exit A32 : DM VR 1, push the MENU button once.
- (14) Enter A35 : DM VR 4.
- (15) Set the specified data to all items of A35 : DM VR 4.  
(For setting data, refer to the table below.)

**Note**

Some setting data are different according to the board number suffix (XX of 1-648-541-XX) of DM-89 board.

- (16) To exit A35 : DM VR 4, push the MENU button once.
- (17) Enter A36 : DM VR 5.
- (18) Set the specified data to all items of A36 : DM VR 5.  
(For setting data, refer to the table below.)
- (19) To exit A36 : DM VR 5, push the MENU button once.
- (20) Enter A3F : NV-RAM CONTROL of the maintenance mode.
- (21) Execute “SAVE ALL ADJUST DATA”.
- (22) Check that the message “Save Complete” is displayed on the video monitor.
- (23) To exit A3F : NV-RAM CONTROL, push the MENU button once.

<b>Item of A3 :BETACAM ADJUST</b>		<b>Setting data for DNW-A22</b>	<b>Setting data for DNW-A22P</b>
A34 : DM VR 3	SUB METAL-Y-A	AF	B2
	SUB METAL-Y-B	AF	B2
	SUB METAL-C-A	70	91
	SUB METAL-C-B	70	91
	SUB OXIDE-Y-A	B2	BB
	SUB OXIDE-Y-B	B2	BB
	SUB OXIDE-C-A	A7	A8
	SUB OXIDE-C-B	A7	A8
A35 : DM VR 4	GUARD BAND METAL-Y	1D (suffix-13 only: 38)	27 (suffix-13 only: 29)
	GUARD BAND METAL-C	1C (suffix-13 only: 21)	23 (suffix-13 only: 16)
	GUARD BAND OXIDE-Y	32 (suffix-13 only: 48)	2F (suffix-13 only: 3B)
	GUARD BAND OXIDE-C	31 (suffix-13 only: 30)	29 (suffix-13 only: 16)
	OMC DC METAL-Y	E4	E4
	OMC DC METAL-C	D0	D0
	OMC DC OXIDE-Y	D0	D0
	OMC DC OXIDE-C	D0	D0
A36 : DM VR 5	DO TH METAL-Y	15	1E
	DO TH METAL-C	14	1D
	DO TH OXIDE-Y	2A	2A
	DO TH OXIDE-C	28	28
	ENV-TH-H	20	20
	ENV-TH-L	10	10

## **2. EQ RF Output Level Adjustment**

---

## Note

Wait for more than 20 minutes after turning on the power, then perform the adjustments.

Measuring equipment: Oscilloscope (Band width limit: ON)

- (1) Enter A30 : EQ VR of the maintenance mode.
  - (2) Connect and set the oscilloscope as follows:

CH-1: TP100/DM-89(F-7), AC 100 mV/DIV, 2 ms/DIV, GND: E

- Trigger: TP4/DM-89(

METAL Y adjustment  
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and

### perform

## Note

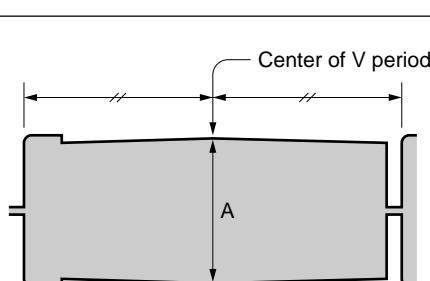
Adjust each signal of Y-A and Y-B channels.

Set the trigger of oscilloscope to – slope before

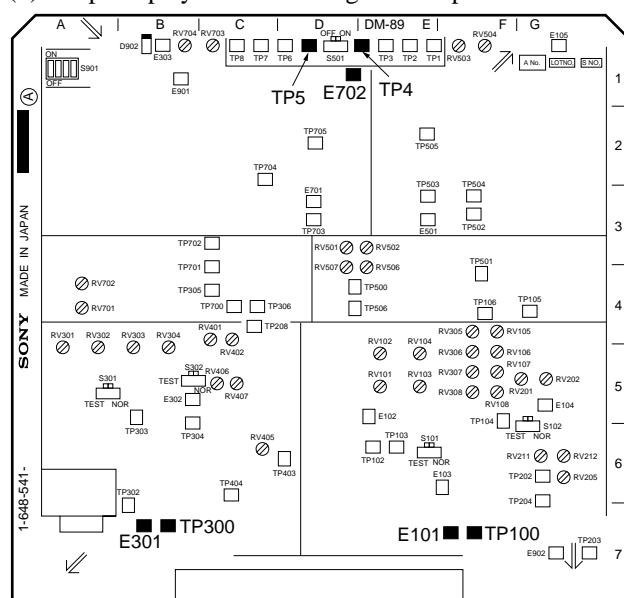
Architectural Unit 1000-1000-1000-1000-1000-1000-1000-1000

Y-A channel: A30 : EQ VR : RF GAIN METAL-Y-A

Y-B channel: A30 : EQ VR : RF GA  
Specifications (X-A and X-B channels):  $\Delta = 380 \pm 20 \text{ mV}$ ,  $\mu = 1$



- (4) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.



DM-89 Board (A Side)

- (5) Change the connection of the oscilloscope as follows:

CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)

Trigger: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

- (6) METAL C adjustment

Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

**Note**

Adjust each signal of C-A and C-B channels.

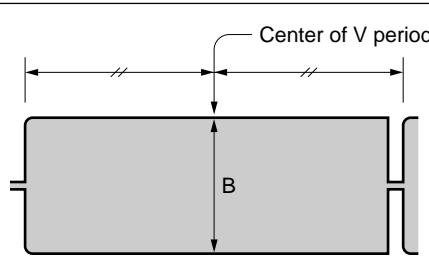
Set the trigger of oscilloscope to - slope before adjusting the C-A channel.

Set to + slope before adjusting the C-B channel.

Adjustment points: C-A channel: A30 : EQ VR : RF GAIN METAL-C-A

C-B channel: A30 : EQ VR : RF GAIN METAL-C-B

Specifications (C-A and C-B channels):  $B = 380 \pm 20 \text{ mV p-p}$



- (7) Eject the alignment tape CR5-1B/CR5-1B PS.

- (8) OXIDE C adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

**Note**

Adjust each signal of C-A and C-B channels.

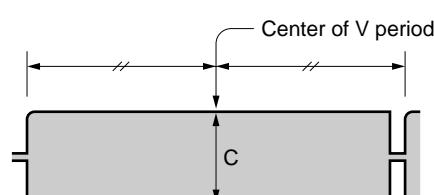
Set the trigger of oscilloscope to - slope before adjusting the C-A channel.

Set to + slope before adjusting the C-B channel.

Adjustment points: C-A channel: A30 : EQ VR : RF GAIN OXIDE-C-A

C-B channel: A30 : EQ VR : RF GAIN OXIDE-C-B

Specifications (C-A and C-B channels):  $C = 250 \pm 20 \text{ mV p-p}$



- (9) Stop the playback of the alignment tape CR5-2A/CR5-2A PS.

- (10) Change the connection of the oscilloscope as follows:

CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)

Trigger: TP4/DM-89(E-1), GND: E702/DM-89(D-1)

## (11) OXIDE Y adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

**Note**

Adjust each signal of Y-A and Y-B channels.

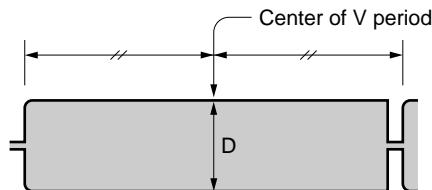
Set the trigger of oscilloscope to - slope before adjusting the Y-A channel.

Set to + slope before adjusting the Y-B channel.

Adjustment points: Y-A channel: A30 : EQ VR : RF GAIN OXIDE-Y-A

Y-B channel: A30 : EQ VR : RF GAIN OXIDE-Y-B

Specifications (Y-A and Y-B channels):  $D = 250 \pm 20 \text{ mV p-p}$



## (12) Eject the alignment tape CR5-2A/CR5-2A PS.

(13) To exit A30 : EQ VR, push the MENU button once on the lower control panel.

## (14) Data save

Enter A3F : NV-RAM CONTROL of the maintenance mode, then execute "SAVE ALL ADJUST DATA".

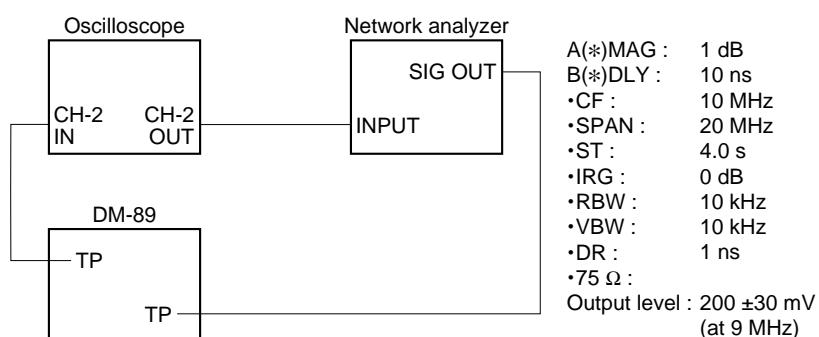
(15) Check that the message "Save Complete" is displayed on the video monitor.

(16) To exit A3F : NV-RAM CONTROL, push the MENU button once.

**3. Cosine Equalizer Adjustment****Note**

If the network analyzer is not available, perform "4. Cosine Equalizer Provisional Adjustment".

Measuring equipment: Network analyzer and Oscilloscope (Refer to next figure.)

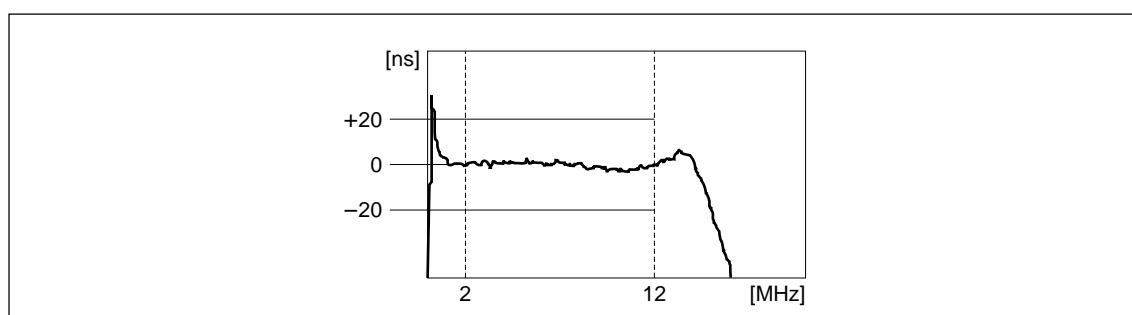


Connection and Setting of Network Analyzer

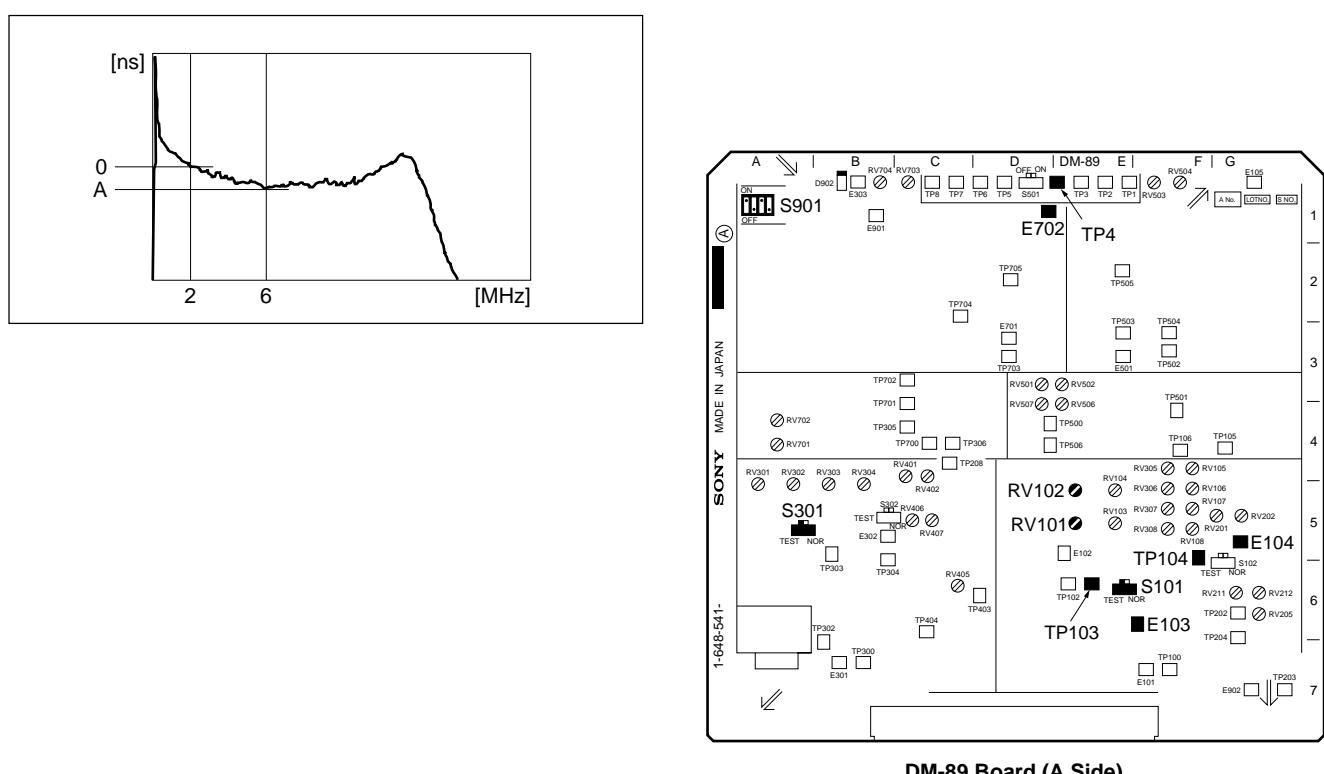
- (1) Set No.1 and No.3 of S901/DM-89(A-1) to ON (up side).
- (2) Set S101/DM-89(E-6) and S301/DM-89(A-5) to TEST (left) side.
- (3) Insert the alignment tape CR5-1B or CR5-1B PS. (STANDBY OFF mode)  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

#### METAL Y adjustment [to step (16)]

- (4) Short-circuits TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.
- (5) Connect the output of network analyzer to TP103/DM-89(E-6).  
GND: E103/DM-89(F-6)
- (6) Connect the oscilloscope's CH-2 to TP104/DM-89(F-5).  
GND: E104/DM-89(G-5)
- (7) METAL Y, Grope delay adjustment  
Adjust the group delay in 2 MHz through 12 MHz to satisfy the specification.  
Adjustment Point:  $\bullet$ RV101/DM-89(E-5) and  $\bullet$ RV102/DM-89(E-5)  
Specification:  $0 \pm 20$  ns



- (8) For DNW-A22 only  
Adjust the delay time at 6 MHz use 2 MHz as the reference to satisfy the specification.  
Adjustment Point:  $\bullet$ RV101/DM-89(E-5)  
Specification:  $A = -10 \pm 3$  ns



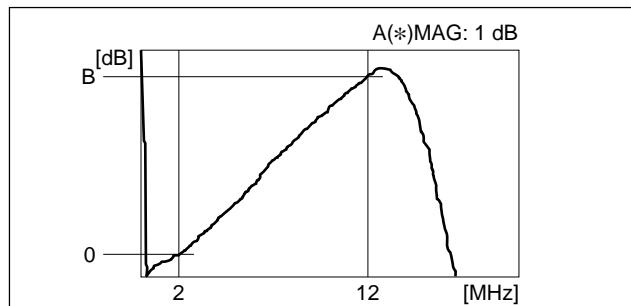
- (9) Enter A33 : DM VR 2 of the maintenance mode.
  - (10) Connect the oscilloscope's CH-2 to TP3/DM-89(E-1). GND: E702/DM-89(D-1)
  - (11) METAL Y, Main adjustment

(i) Adjust the level difference at 12 MHz use 2 MHz as the reference to satisfy the specification.

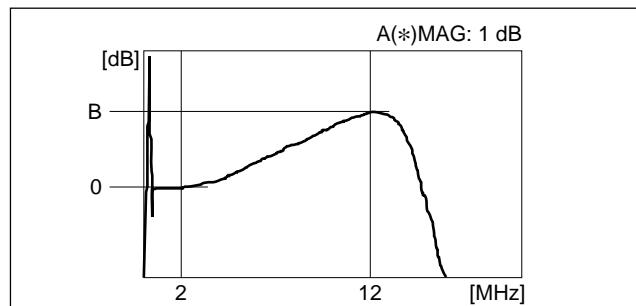
Adjustment point: A33 : DM VR 2 : MAIN METAL-Y-A

Specification: DNW-A22:  $B = +8.0 \pm 0.5$  dB

DNW-A22P:  $B = +3.5 \pm 0.5$  dB



DNW-A22



DNW-A22P

(ii) Set the data value of A33 : DM VR 2 : MAIN METAL-Y-B to the identical data value as MAIN METAL-Y-A.

- (12) To exit A33 : DM VR 2, push the MENU button once.
  - (13) Enter A34 : DM VR 3 of the maintenance mode.
  - (14) METAL Y. Sub adjustment

For DNW-A22

Confirm that the data value of A34 : DM YR 3 : SUB METAL-Y-A and SUB METAL-Y-B are AE

If not, set them to AF.

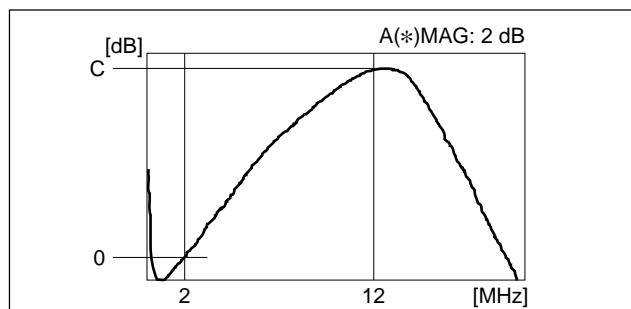
For DNW-A22P

(i) Connect the oscilloscope's CH-2 to TP2/DM-89(E-1). GND: E702/DM-89(D-1)

(ii) Adjust the level difference at 12 MHz use 2 MHz as the reference to satisfy the specification.

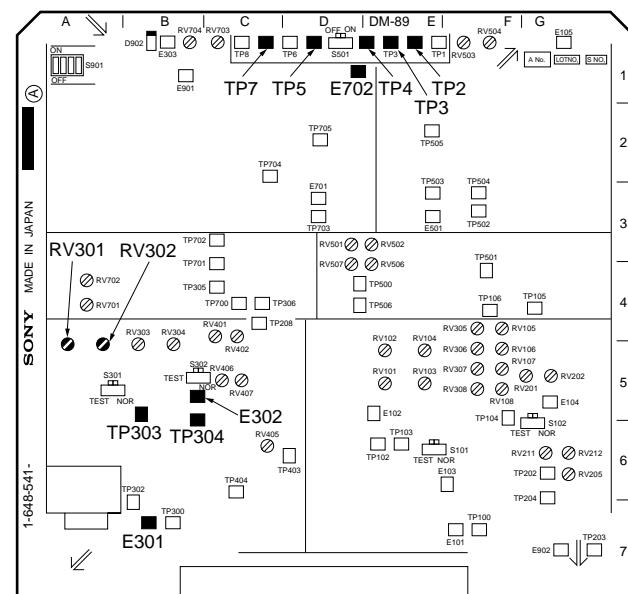
Adjustment point: A34 : DM VR 3 : SUB METAL-Y-A

Specification: C = +16.5 ±1.0 dB



(iii) Set the data value of A34 : DM VR 3 : SUB  
METAL-Y-B to the identical data value as SUB  
METAL\_X\_A

- (15) To exit A34 : DM VR 3, push the MENU button once.
  - (16) Disconnect the shorting clip from TP4/DM-89(E-1)



DM-89 Board (A Side)

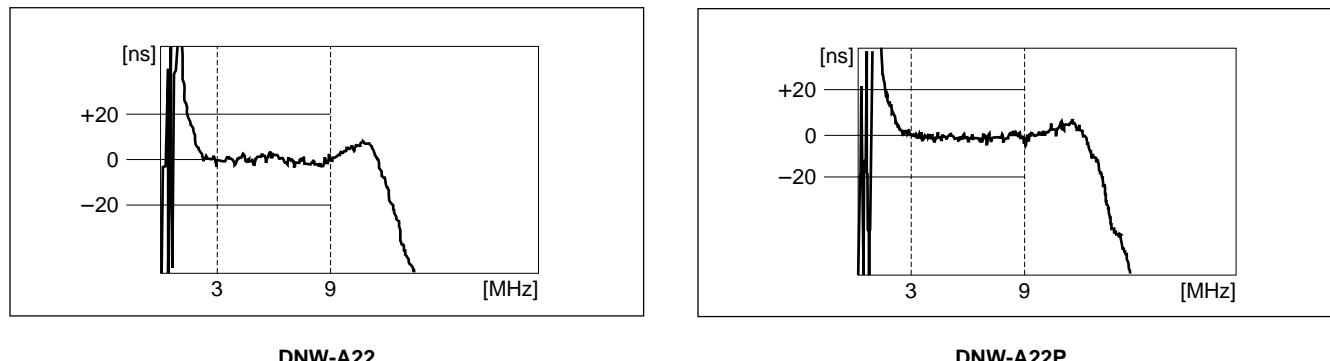
**METAL C adjustment [to step (28)]**

- (17) Short-circuits TP5/DM-89(D-1) and E702/DM-89(D-1) with a shorting clip.
- (18) Connect the output of network analyzer to TP303/DM-89(B-5). GND: E301/DM-89(B-7)
- (19) Connect the oscilloscope's CH-2 to TP304/DM-89(B-5). GND: E302/DM-89(B-5)
- (20) METAL C, Group delay adjustment

Adjust the group delay in 3 MHz through 9 MHz to satisfy the specification.

Adjustment point:  $\bullet$ RV301/DM-89(A-5) and  $\bullet$ RV302/DM-89(A-5)

Specification:  $0 \pm 20$  ns



DNW-A22

DNW-A22P

- (21) Connect the oscilloscope's CH-2 to TP7/DM-89(C-1). GND: E702/DM-89(D-1)

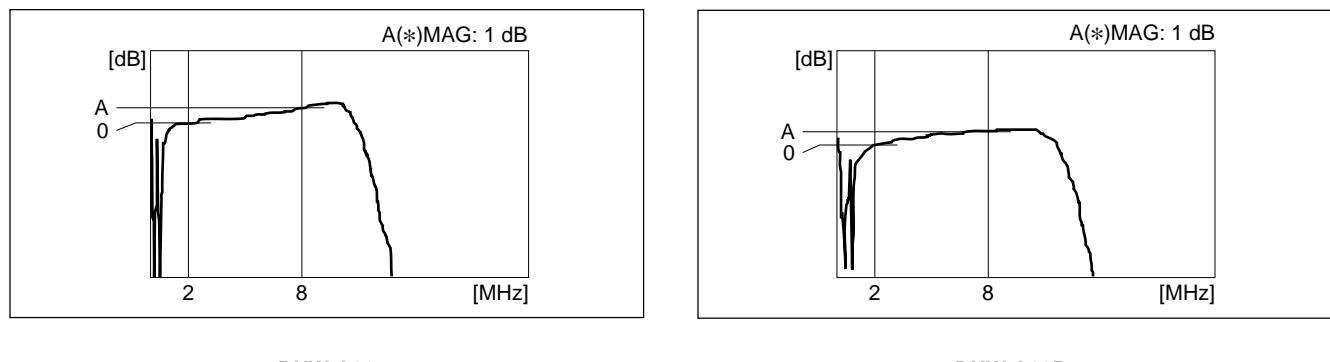
- (22) Enter A33 : DM VR 2 of the maintenance mode.

- (23) METAL C, Main adjustment

- (i) Adjust the level difference at 8 MHz use 2 MHz as the reference to satisfy the specification.

Adjustment point: A33 : DM VR 2 : MAIN METAL-C-A

Specification:  $A = +0.5 \pm 0.5$  dB



DNW-A22

DNW-A22P

- (ii) Set the data value of A33 : DM VR 2 : MAIN METAL-C-B to the identical data value as MAIN METAL-C-A.

- (24) To exit A33 : DM VR 2, push the MENU button once.

(25) Enter A34 : DM VR 3 of the maintenance mode.

(26) METAL C, Sub adjustment

#### For DNW-A22

Conform that the data value of A34 : DM VR 3 : SUB METAL-C-A and SUB METAL-C-B are 70.

If not, set them to 70.

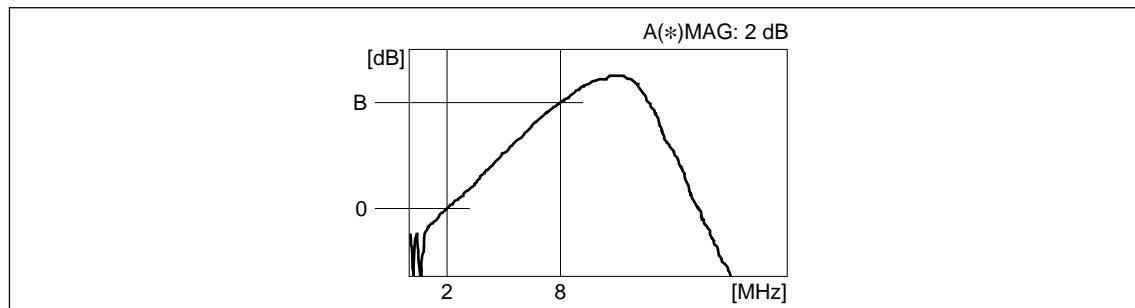
#### For DNW-A22P

(i) Connect the oscilloscope's CH-2 to TP6/DM-89(D-1). GND : E702/DM-89(D-1)

(ii) Adjust the level difference at 8 MHz use 2 MHz as the reference to satisfy the specification.

Adjustment point: A34 : DM VR 3 : SUB METAL-C-A

Specification:  $B = +9.2 \pm 1.0 \text{ dB}$



(iii) Set the data value of A34 : DM VR 3 : SUB METAL-C-B to the identical data value as SUB METAL-C-A.

(27) Eject the alignment tape CR5-1B/CR5-1B PS.

(28) To exit A34 : DM VR 3, push the MENU button once.

#### OXIDE C adjustment [to step (41)]

(29) Insert the alignment tape CR5-2A or CR5-2A PS. (STANDBY OFF mode)

(DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

(30) Connect the output of network analyzer to TP303/DM-89(B-5). GND: E301/DM-89(B-7)

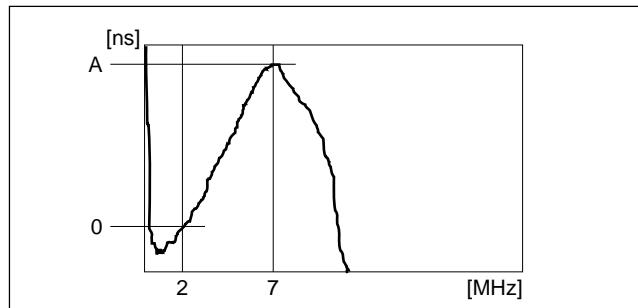
(31) Connect the oscilloscope's CH-2 to TP304/DM-89(B-5). GND: E302/DM-89(B-5)

(32) OXIDE C, Group delay adjustment

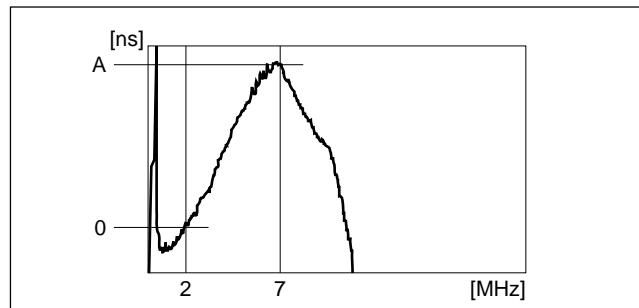
Adjust the delay time at 7 MHz use 2 MHz as the reference to satisfy the specification.

Adjustment point:  $\bullet\text{RV303/DM-89(B-5)}$  and  $\bullet\text{RV304/DM-89(B-5)}$

Specification:  $A = 70 \pm 5 \text{ ns}$



**DNW-A22**

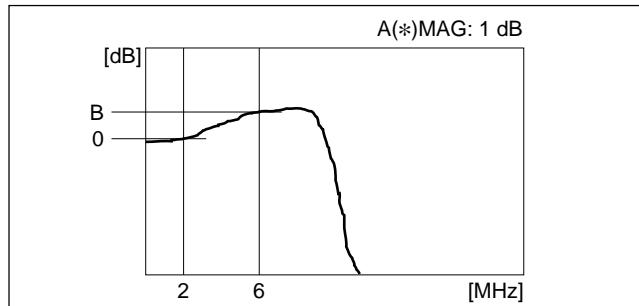


**DNW-A22P**

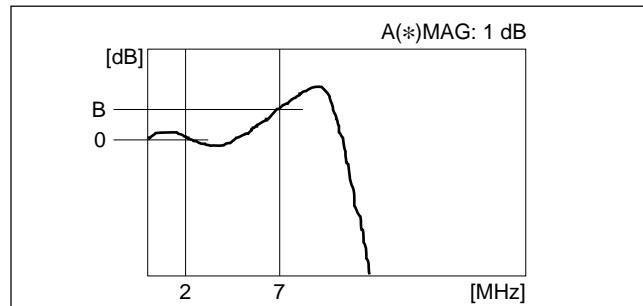
- (33) Connect the oscilloscope's CH-2 to TP7/DM-89(C-1). GND: E702/DM-89(D-1)  
(34) Enter A33 : DM VR 2 of the maintenance mode.  
(35) OXIDE C, Main adjustment

(i) Adjust the level difference at 6 MHz (DNW-A22) or 7 MHz (DNW-A22P) use 2 MHz as the reference to satisfy the specification.

Adjustment point: A33 : DM VR 2 : MAIN OXIDE-C-A  
Specification: B = +1.2 ±0.5 dB



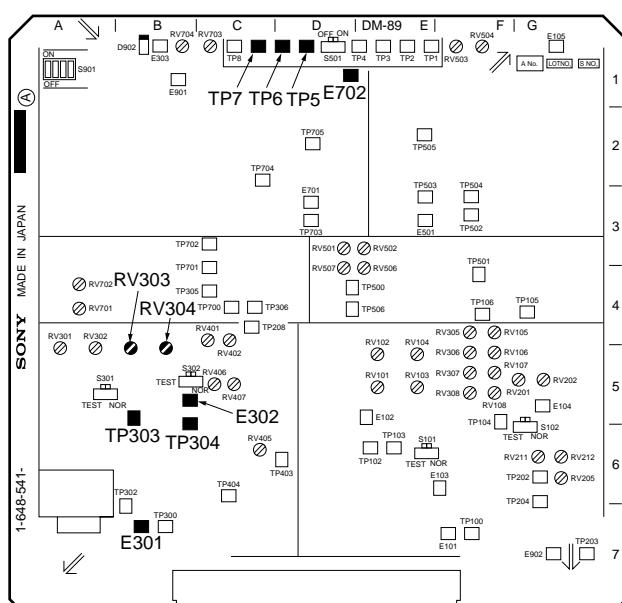
DNW-A22



DNW-A22P

- (ii) Set the data value of A33 : DM VR 2 : MAIN OXIDE-C-B to the identical data value as MAIN OXIDE-C-A.

(36) To exit A33 : DM VR 2, push the MENU button once.

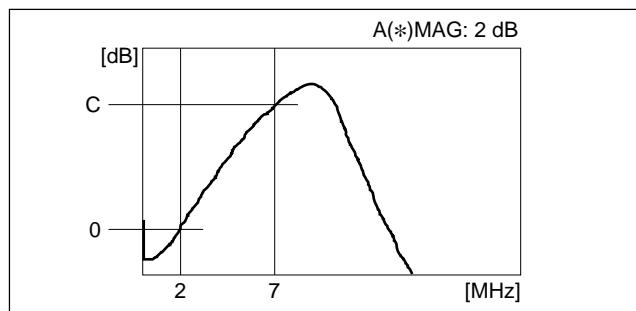


DM-89 Board (A Side)

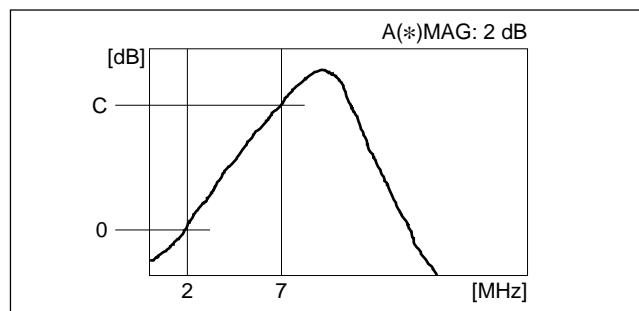
- (37) Enter A34 : DM VR 3 of the maintenance mode.  
(38) Connect the oscilloscope's CH-2 to TP6/DM-89(D-1). GND: E702/DM-89(D-1)  
(39) OXIDE C, Sub adjustment

(i) Adjust the level difference at 7 MHz use 2 MHz as the reference to satisfy the specification.

Adjustment point: A34 : DM VR 3 : SUB OXIDE-C-A  
Specification: C = +11.0 ±0.5 dB



DNW-A22

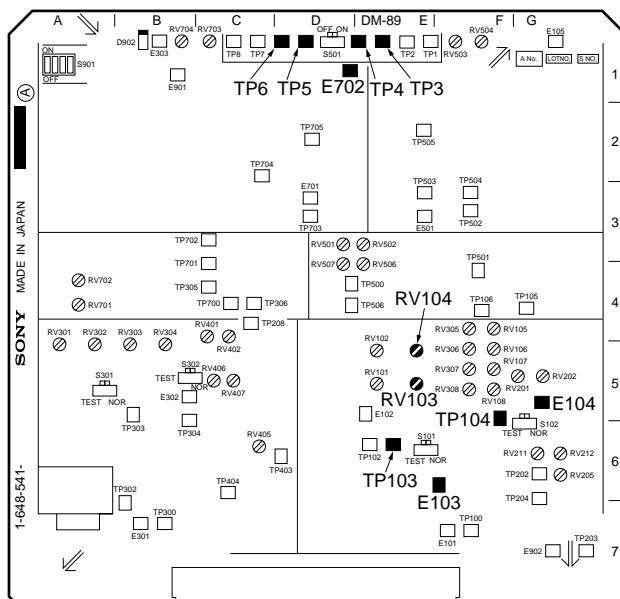


DNW-A22P

- (ii) Set the data value of A34 : DM VR 3 : SUB OXIDE-C-B to the identical data value as SUB OXIDE-C-A.

(40) To exit A34 : DM VR 3, push the MENU button once.

(41) Disconnect the shorting clip from TP5/DM-89(D-1).



DM-89 Board (A Side)

**OXIDE Y adjustment [to step (56)]**

- (42) Turn RV103/DM-89(E-5) counterclockwise fully when exist it.

**Note**

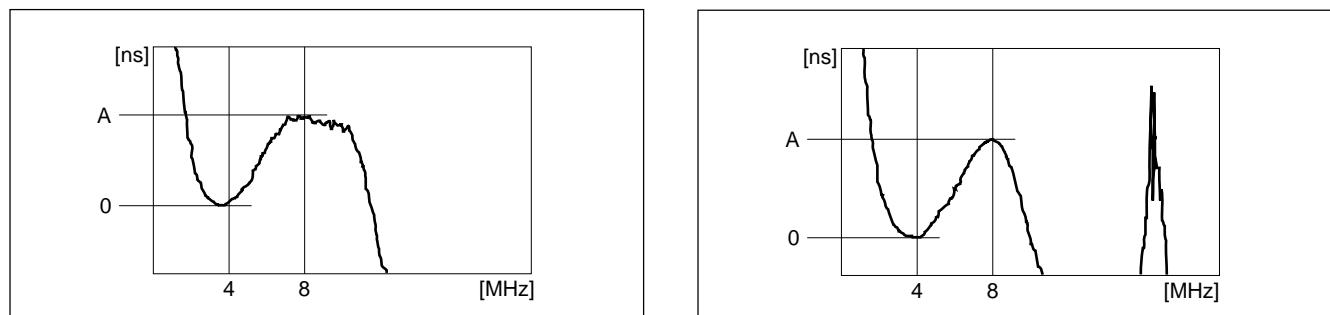
RV103 is not equipped with the DM-89 board of the LOT Nos. 407 and higher.

- (43) Short-circuits TP4/DM-89(E-1) and E702/DM-89(D-1) with a shorting clip.  
 (44) Connect the output of network analyzer to TP103/DM-89(E-6). GND: E103/DM-89(F-6)  
 (45) Connect the oscilloscope's CH-2 to TP104/DM-89(F-5). GND: E104/DM-89(G-5)  
 (46) OXIDE Y, Group delay adjustment

Adjust the delay time at 8 MHz use 4 MHz as the reference to satisfy the specification.

Adjustment point:  $\bullet$ RV104/DM-89(E-5)

Specification: DNW-A22:  $A = 40 \pm 5$  ns  
 DNW-A22P:  $A = 40 \pm 3$  ns



DNW-A22

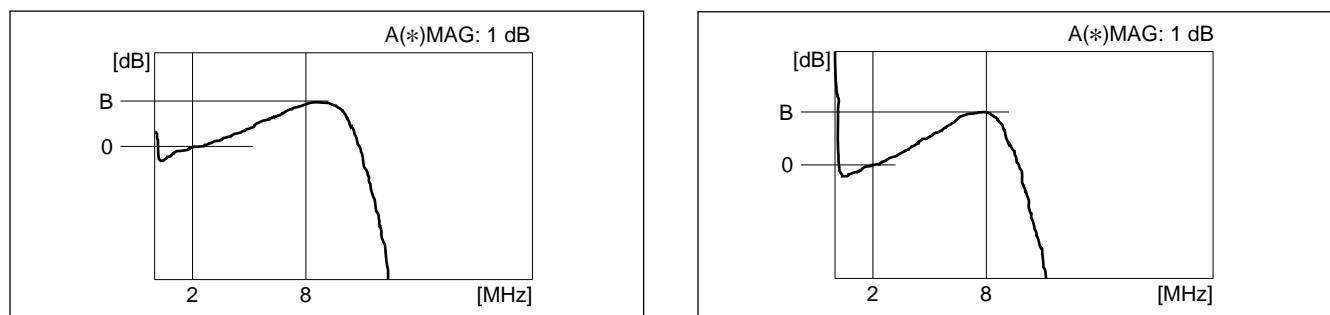
DNW-A22P

- (47) Enter A33 : DM VR 2 of the maintenance mode.  
 (48) Connect the oscilloscope's CH-2 to TP3/DM-89(E-1). GND: E702/DM-89(D-1)  
 (49) OXIDE Y, Main adjustment

- (i) Adjust the level difference at 8 MHz use 2 MHz as the reference to satisfy the specification.

Adjustment point: A33 : DM VR 2 : MAIN OXIDE-Y-A

Specification: DNW-A22:  $B = +2.0 \pm 0.5$  dB  
 DNW-A22P:  $B = +2.5 \pm 0.5$  dB



DNW-A22

DNW-A22P

- (ii) Set the data value of A33 : DM VR 2 : MAIN OXIDE-Y-B to the identical data value as MAIN OXIDE-Y-A.  
 (50) To exit A33 : DM VR 2, push the MENU button once.

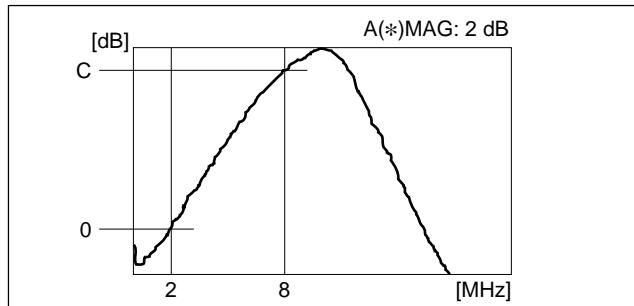
- (51) Enter A34 : DM VR 3 of the maintenance mode.
  - (52) Connect the oscilloscope's CH-2 to TP2/DM-89(E-1). GND: E702/DM-89(D-1)
  - (53) OXIDE Y, Sub adjustment

(i) Adjust the level difference at 8 MHz use 2 MHz as the reference to satisfy the specification.

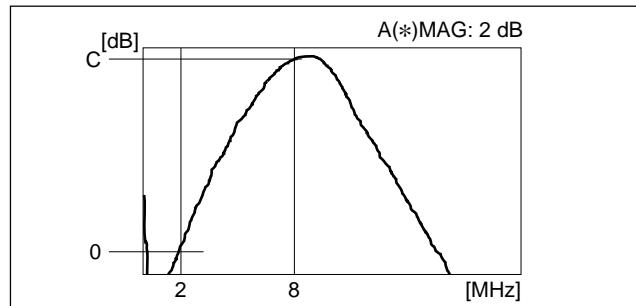
Adjustment point: A34 : DM VR 3 : SUB OXIDE-Y-A

Specification: DNW-A22: C = +14.0 ±0.5 dB

DNW-A22P: C = +17.0 ±0.5 dB



**DNW-A22**



DNW-A22P

- (ii) Set the data value of A34 : DM VR 3 : SUB OXIDE-Y-B to the identical data value as SUB OXIDE-Y-A.
  - (54) Eject the alignment tape CR5-2A/CR5-2A PS.
  - (55) To exit A34 : DM VR 3, push the MENU button once.
  - (56) Disconnect the short clip from TP4/DM-89(E-1) and E702/DM-89(D-1).
  - (57) Reset S101/DM-89(E-6) and S301/DM-89(A-5) to NOR (right) side.
  - (58) Reset No.1 and No.3 of S901/DM-89(A-1) to OFF (down side).

### **Setting of the OMC DC offset [to step (60)]**

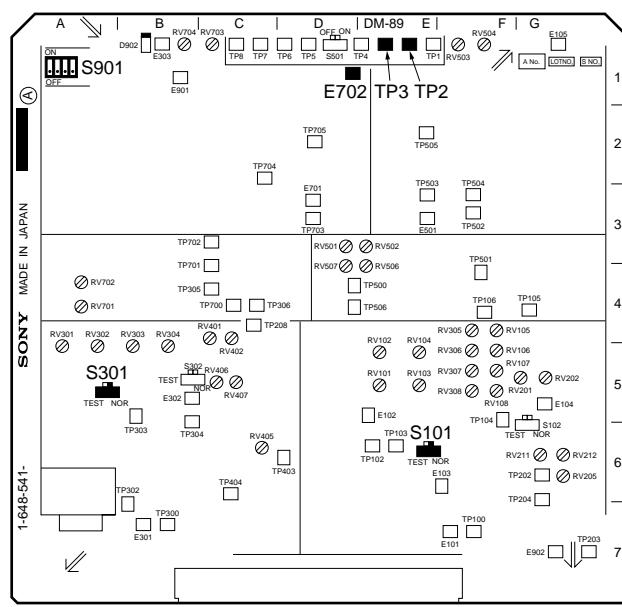
- (59) Enter A35 : DM VR 4 of the maintenance mode.
  - (60) Confirm the setting data of following items of A35 : DM VR 4.

Item of A35 : DM VR 4	Setting data
OMC DC METAL-Y	E4
OMC DC METAL-C	D0
OMC DC OXIDE-Y	D0
OMC DC OXIDE-C	D0

- (61) To exit A35 : DM VR 4, push the MENU button once.

## Data save [to step (64)]

- (62) Enter A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA”.
  - (63) Check that the message “Save Complete” is displayed on the video monitor.
  - (64) To exit A3F : NV-RAM CONTROL, push the MENU button once.



DM-89 Board (A Side)

#### 4. Cosine Equalizer Provisional Adjustment

##### Notes

- This provisional adjustment explains how to adjust without using the network analyzer. When performed “3. Cosine Equalizer Adjustment” using the network analyzer, this provisional adjustment is not necessary to perform.
- Do not perform this provisional adjustment except an urgent maintenance and the network analyzer is not available. If this provisional adjustment is done, it is recommended to perform “3. Cosine Equalizer Adjustment” using the network analyzer later.

- (1) Enter A33 : DM VR 2 of the maintenance mode.
- (2) Confirm the setting data of all items of A33 : DM VR 2.

Item of A33 : DM VR 2	Setting data for DNW-A22	Setting data for DNW-A22P
MAIN METAL-Y-A	CD	B7
MAIN METAL-Y-B	CD	B7
MAIN METAL-C-A	8E	8D
MAIN METAL-C-B	8E	8D
MAIN OXIDE-Y-A	A6	A8
MAIN OXIDE-Y-B	A6	A8
MAIN OXIDE-C-A	9E	9E
MAIN OXIDE-C-B	9E	9E

- (3) To exit A33 : DM VR 2, push the MENU button once.
- (4) Enter A34 : DM VR 3 of the maintenance mode.
- (5) Confirm the setting data of all items of A34 : DM VR 3.

Item of A34 : DM VR 3	Setting data for DNW-A22	Setting data for DNW-A22P
SUB METAL-Y-A	AF	B2
SUB METAL-Y-B	AF	B2
SUB METAL-C-A	70	91
SUB METAL-C-B	70	91
SUB OXIDE-Y-A	B2	BB
SUB OXIDE-Y-B	B2	BB
SUB OXIDE-C-A	A7	A8
SUB OXIDE-C-B	A7	A8

- (6) To exit A34 : DM VR 3, push the MENU button once.
- (7) Enter A35 : DM VR 4 of the maintenance mode.
- (8) Confirm the setting data of following items of A35 : DM VR 4.

Item of A35 : DM VR 4	Setting data
OMC DC METAL-Y	E4
OMC DC METAL-C	D0
OMC DC OXIDE-Y	D0
OMC DC OXIDE-C	D0

- (9) To exit A35 : DM VR 4, push the MENU button once.

## (10) Data save

Enter A3F : NV-RAM CONTROL of the maintenance mode, execute “SAVE ALL ADJUST DATA”.

(11) Check that the message “Save Complete” is displayed on the video monitor.

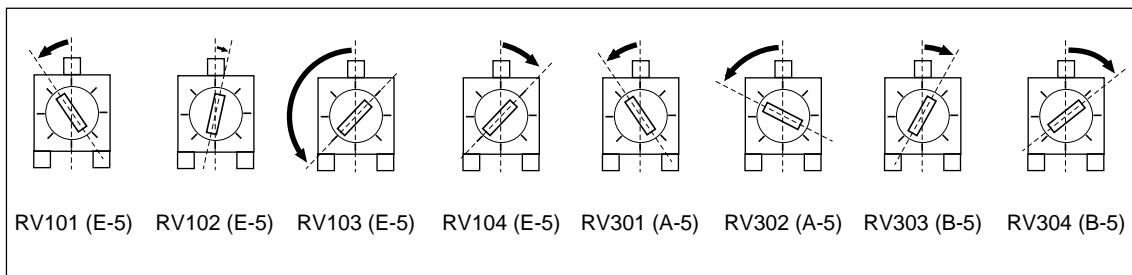
(12) To exit A3F : NV-RAM CONTROL, push the MENU button once.

(13) Set RVs on DM-89 board to each specified position as shown figure below.

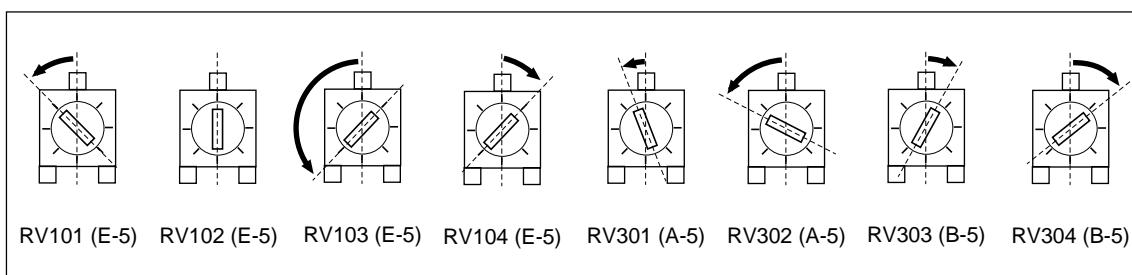
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## Note

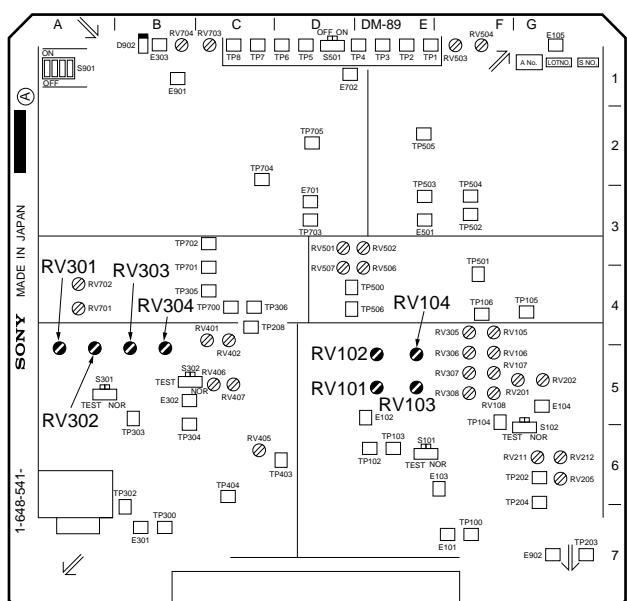
RV103 is not equipped with the DM-89 board of the LOT Nos. 407 and higher



DNW-A22



DNW-A22P



DM-89 Board (A Side)

## 5. DM RF Output Level Rough Adjustment

Measuring equipment: Oscilloscope (Band width limit: ON)

- (1) Connect and set the oscilloscope as follows:

CH-1: TP3/DM-89(E-1), AC 100 mV/DIV, 2 ms/DIV, GND: E702/DM-89(D-1)

CH-2: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)

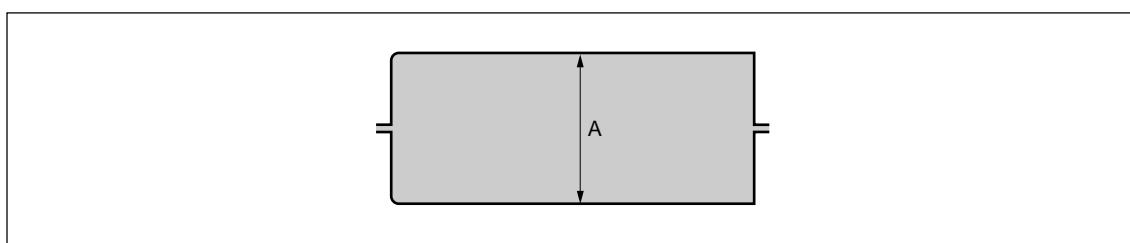
Trigger: CH-2, - slope

- ## (2) METAL Y adjustment

Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B DNW-A22P: CR5-1B PS)

Adjustment point: **SBV211/DM-89(G-6)**

Specification:  $A = 400 \pm 40$  mV p-p



- (3) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

- (4) Change the connection of the oscilloscope as follows:

CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)

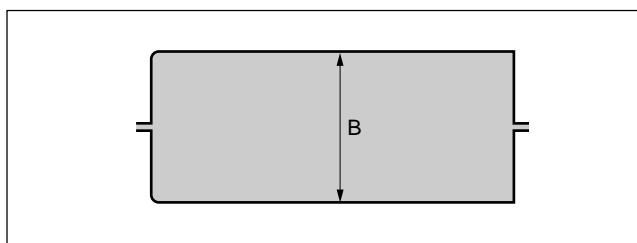
Trigger: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

- ### (5) METAL C adjustment

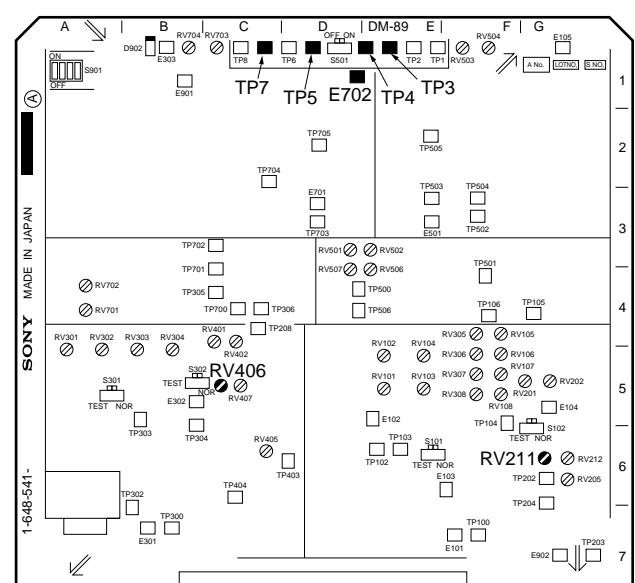
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: **ORV406/DM-89(C-5)**

Specification:  $B = 400 \pm 40$  mV p-p



- (6) Eject the alignment tape CR5-1B/CR5-1B PS.



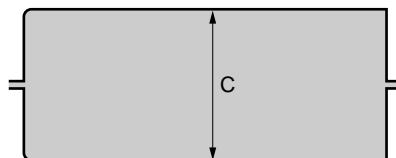
DM-89 Board (A Side)

### (7) OXIDE C adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

Adjustment point: ØRV407/DM-89(C-5)

Specification:  $C = 400 \pm 40 \text{ mV p-p}$



- (8) Stop the playback of the alignment tape CR5-2A/CR5-2A PS.

- (9) Change the connection of the oscilloscope as follows:

CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)

Trigger: TP4/DM-89(E-1), GND: E702/DM-89(D-1)

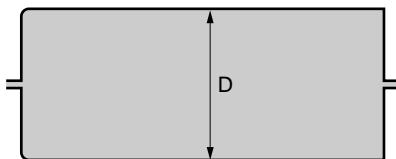
- #### (10) OXIDE Y adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2B.

PS, and perform the adjustment. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

Adjustment point: ~~ORV~~V212/DM-89(G-6)

Specification: D = 400 ±40 mV p-p

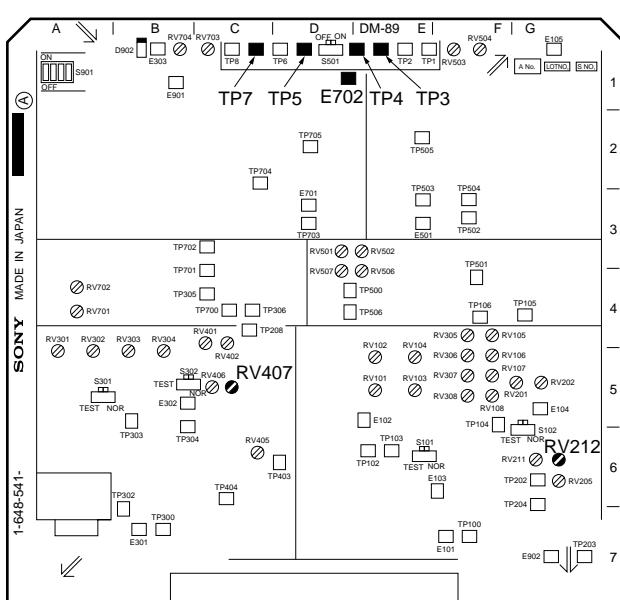


- (11) Stop the playback of the alignment tape CR5-2A/CR5-2A PS or eject it.

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**Note**

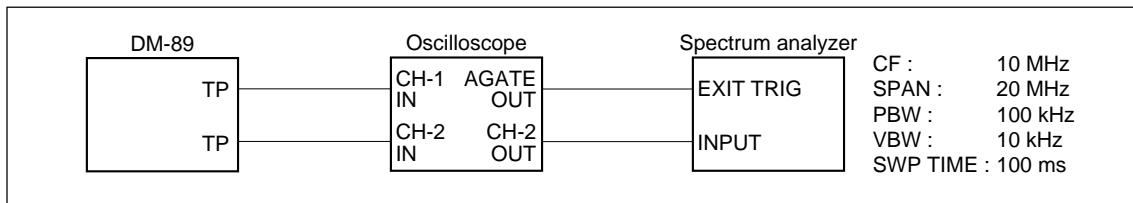
It is not necessary to eject the alignment tape when perform subsequent “6. OMC Carrier Balance Adjustment”.



DM-89 Board (A Side)

## 6. OMC Carrier Balance Adjustment

Measuring equipments: Spectrum analyzer and Oscilloscope (Refer to next figure.)



## Connection and Setting of Spectrum Analyzer

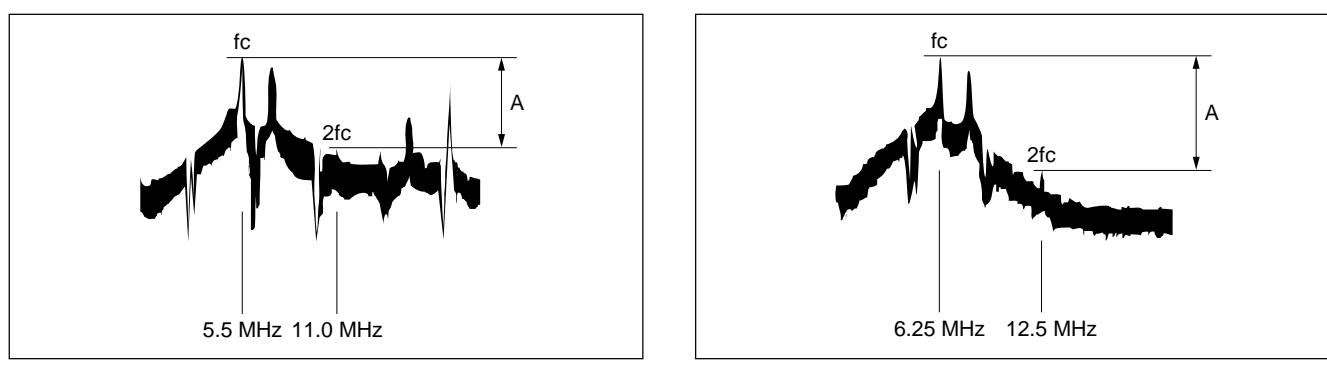
- (1) Connect and set the oscilloscope as follows:  
CH-1: TP4/DM-89(E-1), DC 1 V/DIV, 5 ms/DIV, GND: E702/DM-89(D-1)  
CH-2: TP105/DM-89(G-4), AC 1 V/DIV, GND: E105/DM-89(G-1)  
Trigger: CH-1, - slope
  - (2) OXIDE Y adjustment

Playback the pulse and bar signal portion (9:00 to 11:00) of the alignment tape CR5-2A or CR5-2B.

PS, and perform the adjustment. (DNW-A22; CR5-2A, DNW-A22P; CR5-2A PS)

Adjustment point: ORV107/DM-89(F-5) and ORV108/DM-89(F-5)

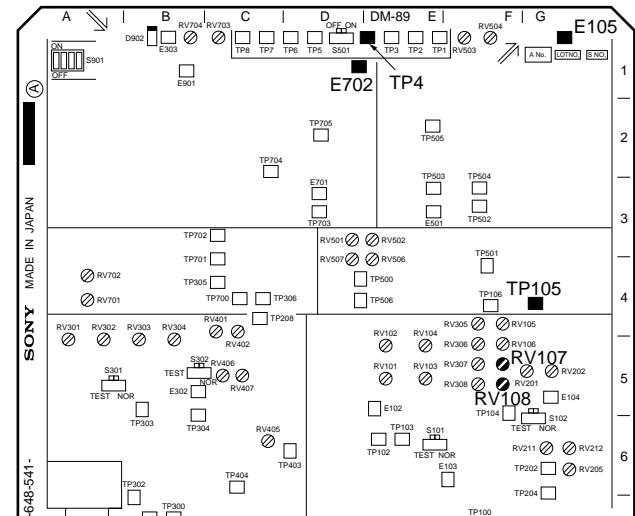
Specification:  $A \geq 35 \text{ dB}$



DNW-A22

DNW-A22P

- (3) Stop the playback of the alignment tape CR5-2A/CR5-2A PS.



DM-89 Board (A Side)

(4) Change the connection of the oscilloscope as follows:

CH-1: TP305/DM-89(C-4), GND: E303/DM-89(B-1)

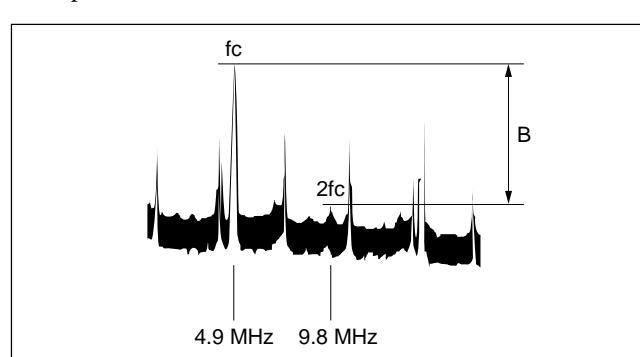
CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

(5) OXIDE C adjustment

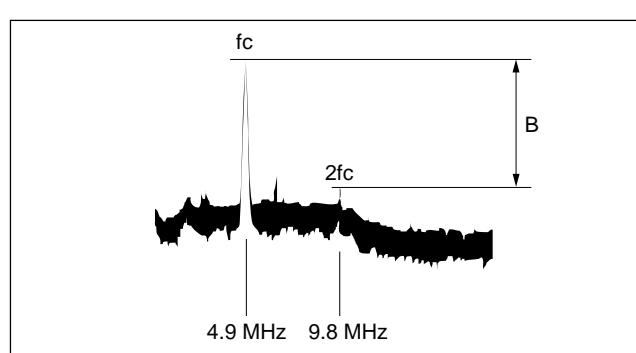
Playback the pulse and bar signal portion (9:00 to 11:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

Adjustment point: **ORV307/DM-89(F-5)** and **ORV308/DM-89(F-5)**

Specification:  $B \geq 35 \text{ dB}$



DNW-A22



DNW-A22P

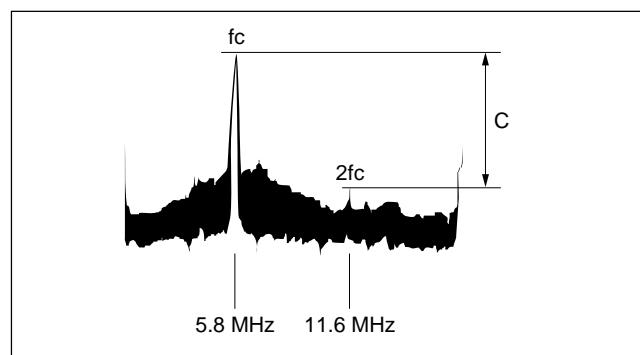
(6) Eject the alignment tape CR5-2A/CR5-2A PS.

(7) METAL C adjustment

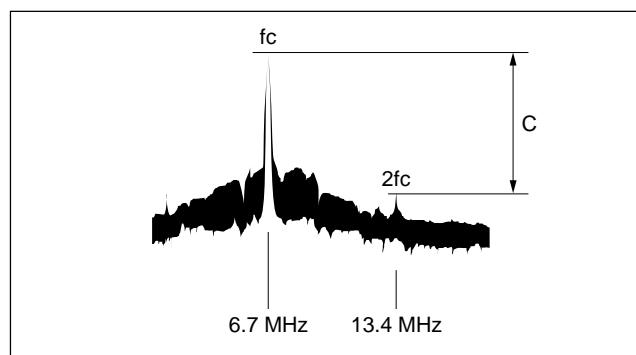
Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: **ORV305/DM-89(F-4)** and **ORV306/DM-89(F-5)**

Specification:  $C \geq 40 \text{ dB}$



DNW-A22



DNW-A22P

(8) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

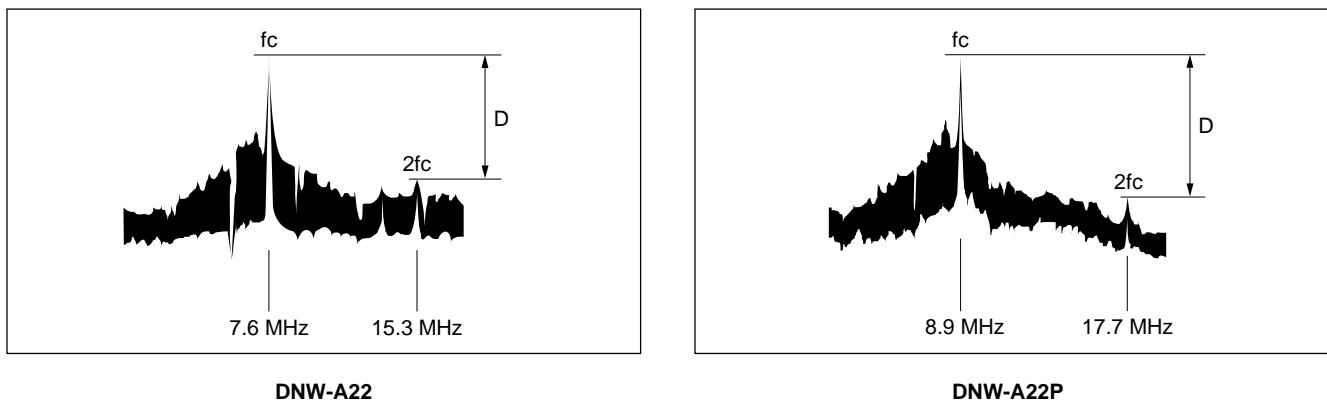
- (9) Change the connection of the oscilloscope as follows:  
CH-1: TP4/DM-89(E-1), GND: E702/DM-89(D-1)  
CH-2: TP105/DM-89(E-1), GND: E105/DM-89(G-1)

#### (10) METAL Y adjustment

Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: ORV105/DM-89(F-4) and ORV106/DM-89(F-5)

Specification: D ≥ 40 dB

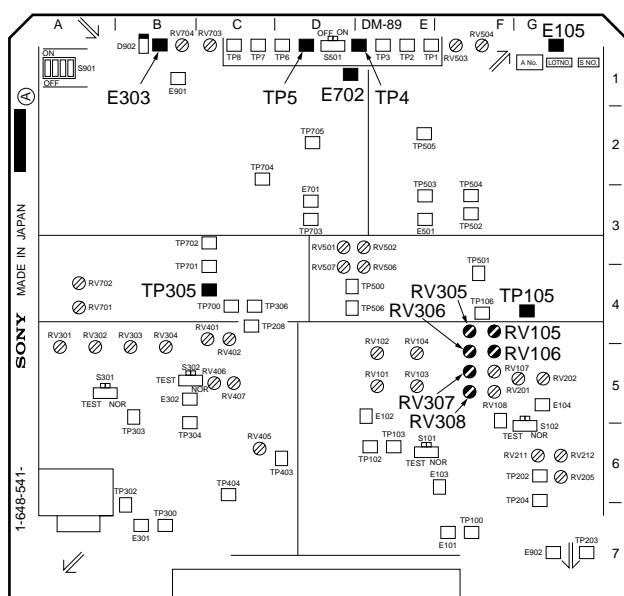


- (11) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

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**Note**

It is not necessary to eject the alignment tape when perform subsequent “8. Demodulator Limiter Balance Adjustment”.



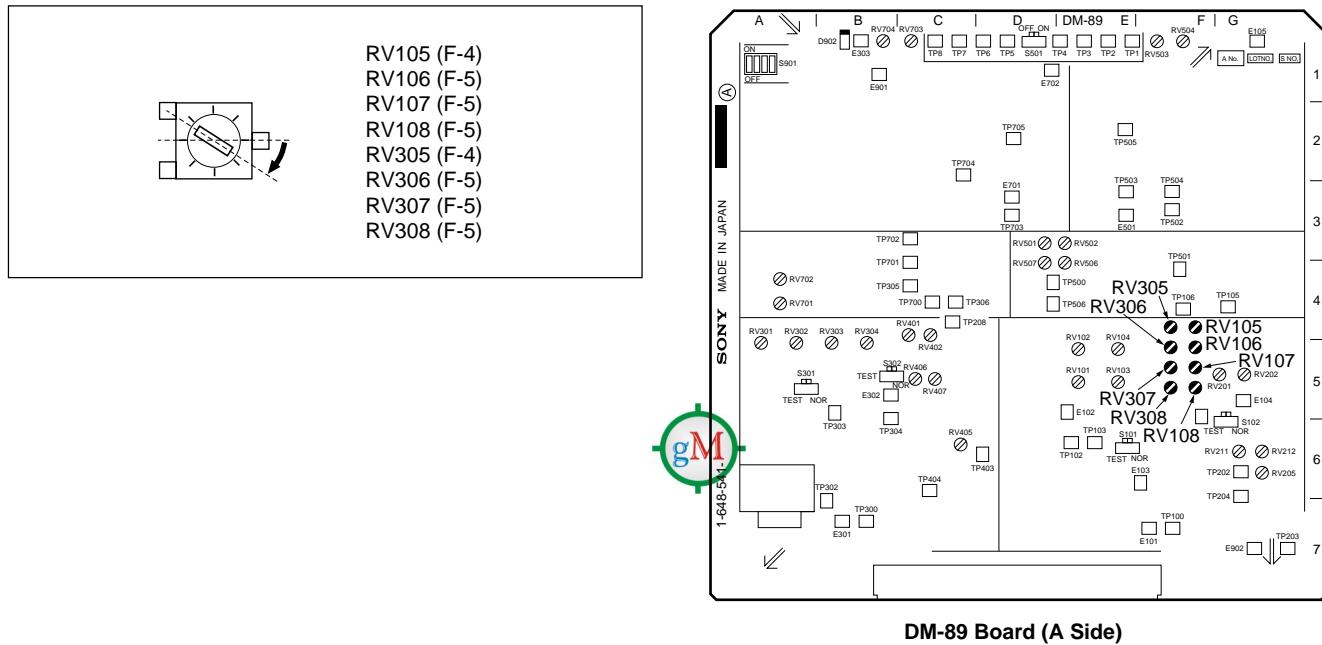
DM-89 Board (A Side)

## 7. OMC Carrier Balance Provisional Adjustment

### Notes

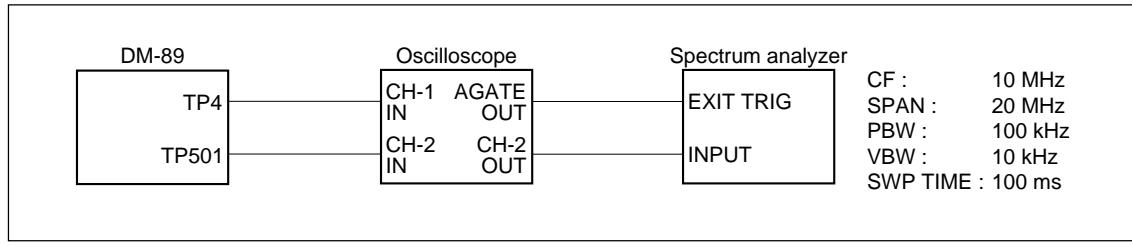
- This provisional adjustment explains how to adjust without using the spectrum analyzer. When performed “6. OMC Carrier Balance Adjustment” using the spectrum analyzer, this provisional adjustment is not necessary to perform.
- Do not perform this provisional adjustment except an urgent maintenance and the spectrum analyzer is not available. If this provisional adjustment is done, it is recommended to perform “6. OMC Carrier Balance Adjustment” using the spectrum analyzer later.

Set RVs on DM-89 board to each specified position as show below.



## 8. Demodulator Limiter Balance Adjustment

Measuring equipment: Spectrum analyzer and Oscilloscope (Refer to next figure.)



### Y adjustment (using the spectrum analyzer)

(1) Connect and set the oscilloscope as follows:

CH-1: TP4/DM-89(E-1), DC 1 V/DIV, 5 ms/DIV, GND: E702/DM-89(D-1)

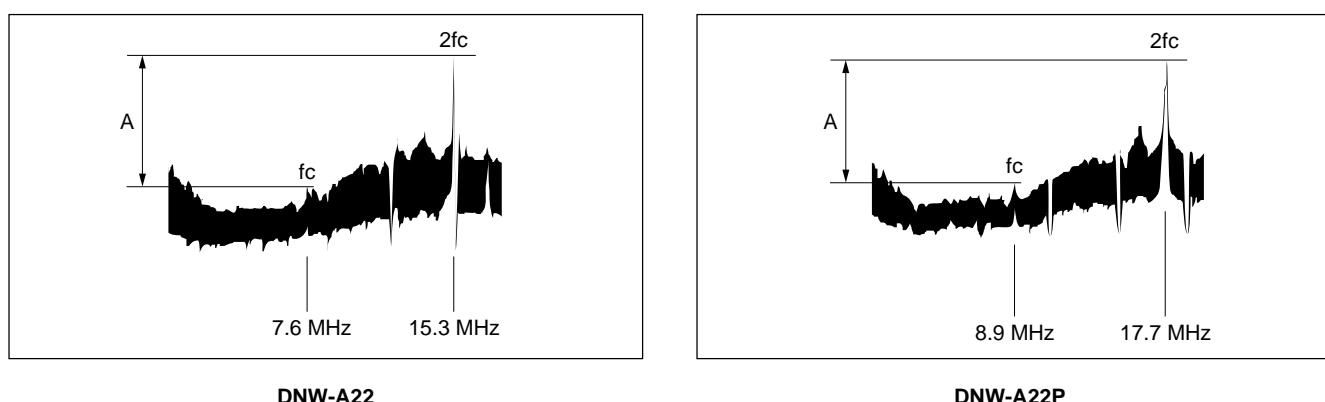
CH-2: TP501/DM-89(F-4), AC 1 V/DIV, GND: E501/DM-89(E-3)

Trigger: CH-1, - slope

(2) Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point:  RV502/DM-89(E-3)

Specification: Maximize the level difference A. (Minimize the fc.)



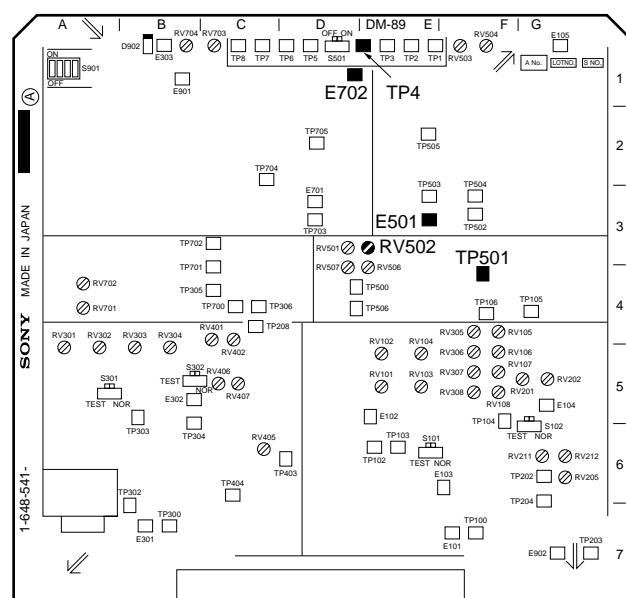
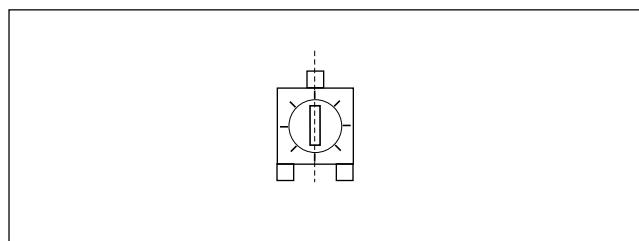
(3) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

### Y provisional adjustment (without using the spectrum analyzer)

#### Notes

- This provisional adjustment explains how to adjust without using the spectrum analyzer. When performed the above adjustment using the spectrum analyzer, this provisional adjustment is not necessary to perform.
- Do not perform this provisional adjustment except an urgent maintenance and the spectrum analyzer is not available. If this provisional adjustment is done, it is recommended to perform the above adjustment using the spectrum analyzer later.

Set RV502/DM-89 (E-3) as show below.



DM-89 Board (A Side)

## C adjustment

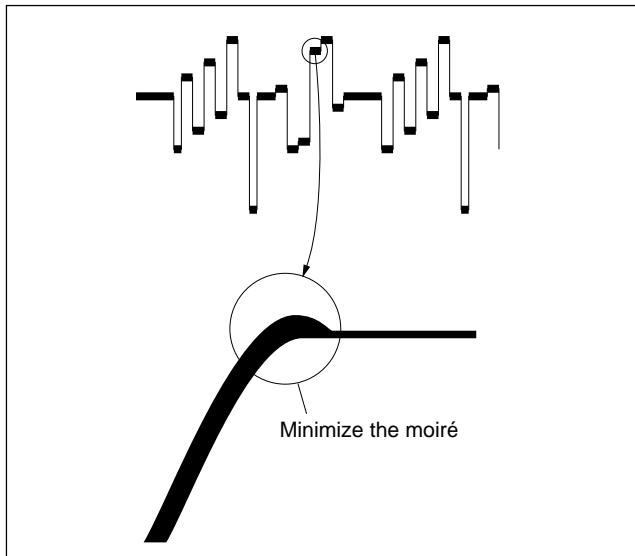
- (4) Connect and set the oscilloscope as follows:

CH-1: TP8/DM-89(C-1), AC 200 mV/DIV, 10  $\mu$ s/DIV, GND: E702/DM-89(D-1)

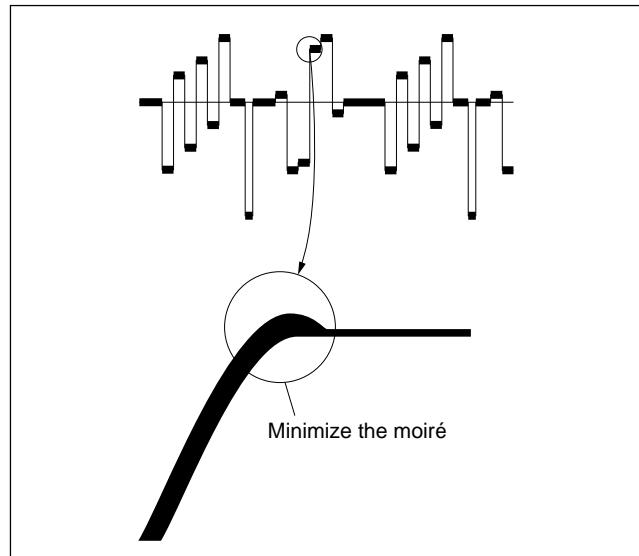
- (5) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: **RV702/DM-89(A-4)**

Specification: Minimize the moiré of specified part.



DNW-A22

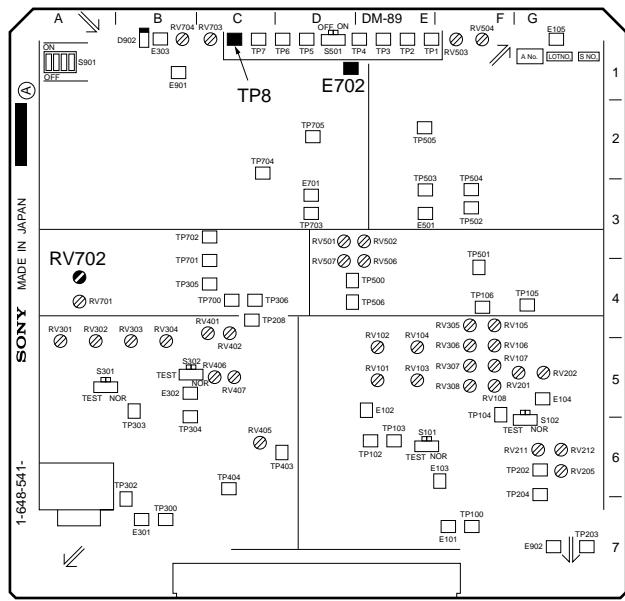


DNW-A22P

- (6) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

**Note**

It is not necessary to eject the alignment tape when perform subsequent “9. Non-liner Output Level Adjustment”.



DM-89 Board (A Side)

## 9. Non-liner Output Level Adjustment

## Measuring equipment: Oscilloscope

- (1) Connect and set the oscilloscope as follows:

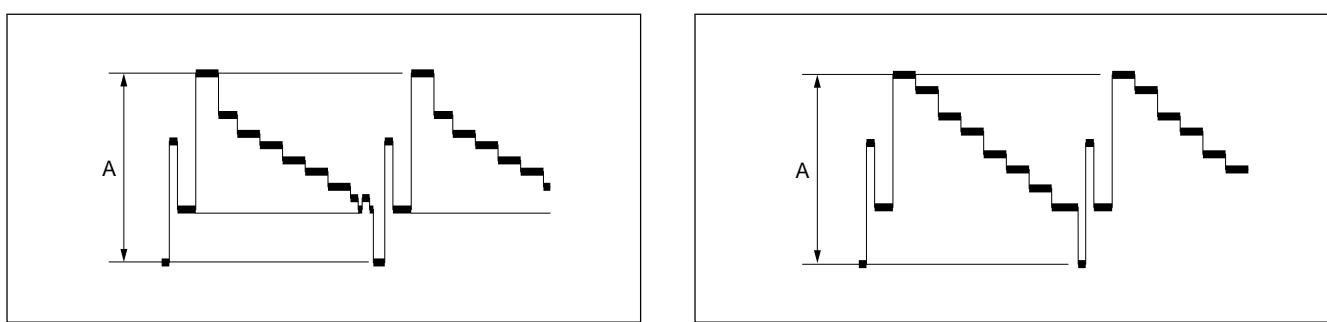
CH-1: TP505/DM-89(E-2), AC 200 mV/DIV, 10  $\mu$ s/DIV, GND: E501/DM-89(E-3)

- ## (2) METAL Y adjustment

Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22; CR5-1B, DNW-A22P; CR5-1B PS)

Adjustment point: **ORV503/DM-89(F-1)**

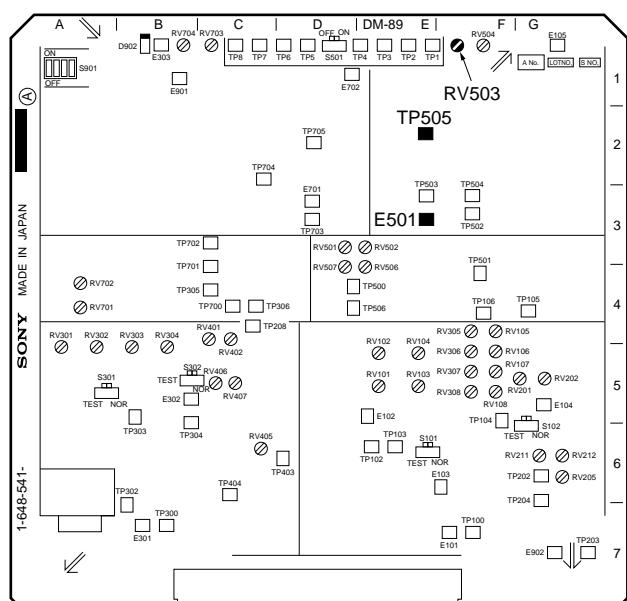
Specification:  $A \equiv 1.00 \pm 0.01$  V



DNW-A22

DNW-A22P

- (3) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.



DM-89 Board (A Side)

- (4) Change the connection of the oscilloscope as follows:

CH-1: TP705/DM-89(D-2), GND: E701/DM-89(D-3)

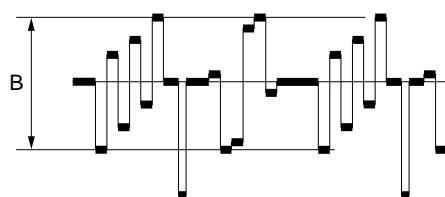
For DNW-A22P only, perform steps (5) and (6).

(5) METAL C adjustment

Playback the 100% color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B PS, and perform the adjustment.

Adjustment point: **ORV703/DM-89(C-1)**

Specification:  $B = 933 \pm 10 \text{ mV}$



- (6) Eject the alignment tape CR5-1B PS.

(7) C adjustment for DNW-A22

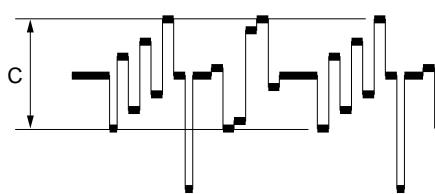
OXIDE C adjustment for DNW-A22P

Playback the 75% color-bar signal portion of the alignment tape CR5-1B or CR5-2A PS, and perform the adjustment.

[DNW-A22: CR5-1B (14:00 to 17:00), DNW-A22P: CR5-2A PS (0:00 to 3:00) ]

Adjustment point: **ORV704/DM-89(B-1)**

Specification:  $C = 700 \pm 10 \text{ mV}$



- (8) For DNW-A22, eject the alignment tape CR5-1B.

For DNW-A22P, stop the playback of the alignment tape CR5-2A PS.

(9) Change the connection of the oscilloscope as follows:

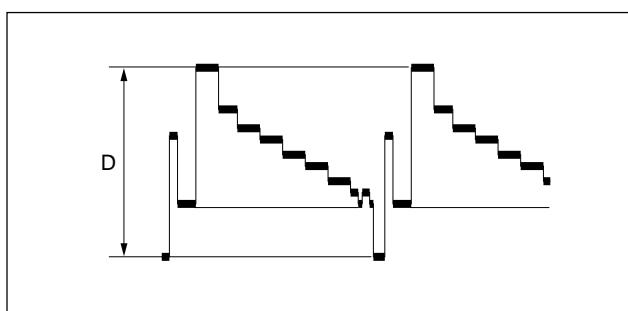
CH-1: TP505/DM-89(E-2), GND: E501/DM-89(E-3)

#### (10) OXIDE Y adjustment

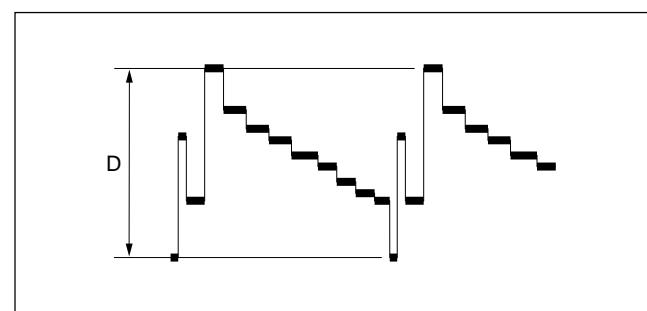
Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A22; CR5-2A, DNW-A22P; CR5-2A PS)

Adjustment point: ORV504/DM-89(F-1)

Specification:  $D = 1.00 \pm 0.01$  V

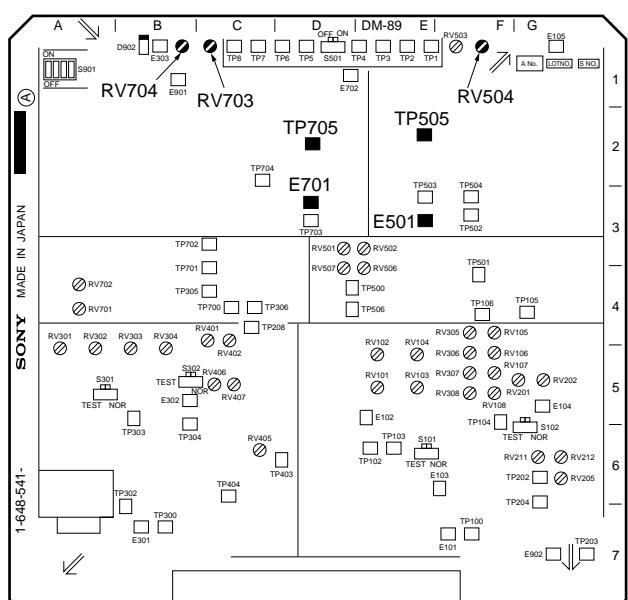


DNW-A22



DNW-A22P

(11) Eject the alignment tape CR5-2A/CR5-2A PS.



DM-89 Board (A Side)

## 10. PB Frequency Response Adjustment

Measuring equipment: Composite waveform monitor (terminated with  $75\ \Omega$ )

- (1) Set S1-2/TBC-23 (C MUTE) to ON.
- (2) Enter A32 : DM VR 1 of the maintenance mode.

### METAL Y adjustment [to step (6)]

- (3) Observe the video output signal at the composite waveform monitor.
- (4) Playback the multiburst signal portion (8:00 to 11:00) of the alignment tape CR5-1B or CR5-1B PS, and adjust that level of specified frequency by table below is satisfy the specification. And check that levels of others are satisfy the specifications.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

#### Note

The Y output is overlapped A and B channels on the composite waveform monitor. Adjust A and B channels alternately.

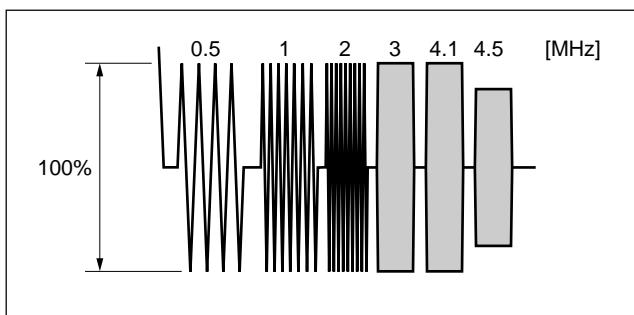
Adjustment points: A channel: A32 : DM VR 1 : EQ1 METAL-Y-A

B channel: A32 : DM VR 1 : EQ1 METAL-Y-B

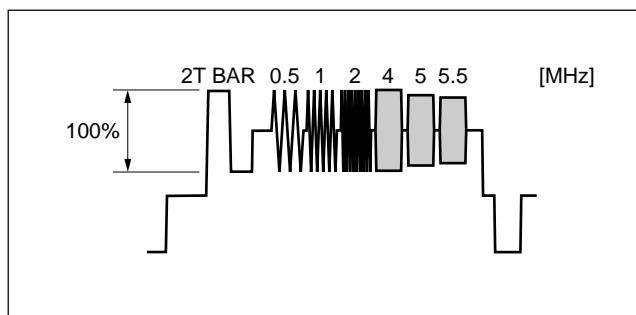
Specifications (A and B channels): Refer to table below.

Frequency	Specifications for DNW-A22	
0.5 MHz	Reference: 100% {0 dB}	
4.1 MHz	Adjust : 94 (100 to 90)%	$\{-0.5 \pm 0.5 \text{ dB}\}$
1 MHz	Check : 100 (106 to 63)%	$\{0 \pm 0.5 \text{ dB}\}$
2 MHz	Check : 100 (106 to 63)%	$\{0 \pm 0.5 \text{ dB}\}$
3 MHz	Check : 100 (106 to 63)%	$\{0 \pm 0.5 \text{ dB}\}$
4.5 MHz	Check : 80 (106 to 63)%	$\{-2.0 \pm 2.5 \text{ dB}\}$

Frequency	Specifications for DNW-A22P	
2T BAR	Reference: 100% {0 dB}	
5 MHz	Adjust : 91 (96 to 87)%	$\{-0.8 \pm 0.4 \text{ dB}\}$
0.5 MHz	Check : 100 (106 to 63)%	$\{0 \pm 0.5 \text{ dB}\}$
1 MHz	Check : 100 (106 to 63)%	$\{0 \pm 0.5 \text{ dB}\}$
2 MHz	Check : 100 (106 to 63)%	$\{0 \pm 0.5 \text{ dB}\}$
4 MHz	Check : 100 (106 to 63)%	$\{0 \pm 0.5 \text{ dB}\}$
5.5 MHz	Check : 84 (106 to 63)%	$\{-1.5 \pm 2.0 \text{ dB}\}$



DNW-A22



DNW-A22P

- (5) Connect the video monitor to VIDEO OUTPUT COMPOSITE 2 connector.
- (6) Playback the multiburst signal portion (8:00 to 11:00) of the alignment tape CR5-1B or CR5-1B PS, and check that the playback picture on the video monitor has no flicker.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

**METAL C adjustment [to step (9)]**

- (7) Observe the R-Y output signal at the oscilloscope.  
 (8) Playback the multiburst signal portion (8:00 to 11:00) of the alignment tape CR5-1B or CR5-1B PS, and adjust that level of specified frequency by table below is satisfy the specification. And check that levels of others are satisfy the specifications.  
 (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

**Note**

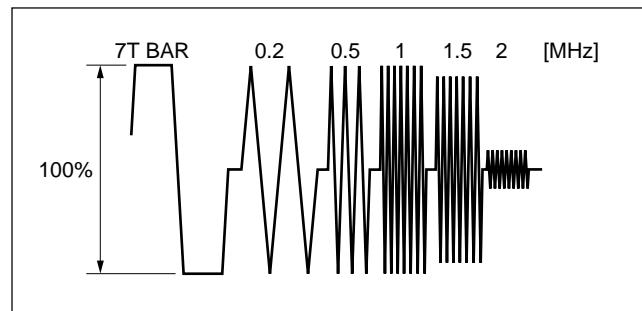
The CTDM signal is displayed on the oscilloscope. The timing order of signal is REF SYNC, R-Y, B-Y. And these signals are overlapped A and B channels. Adjust A and B channels alternately.

Adjustment points: A channel: A32 : DM VR 1 : EQ1 METAL-C-A  
 B channel: A32 : DM VR 1 : EQ1 METAL-C-B

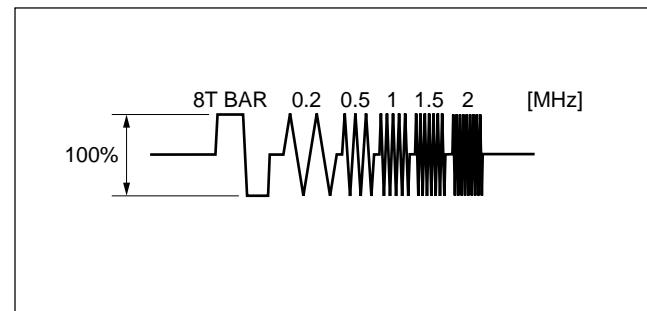
Specifications (A and B channels): Refer to table below.

Frequency	Specification for DNW-A22	
7T BAR	Reference: 100% {0 dB}	
1 MHz	Adjust : 94 (100 to 89)%	{ $-0.5 \pm 0.5$ dB}
0.2 MHz	Check : 100 (106 to 71)%	{ $0 \pm 0.5$ dB}
0.5 MHz	Check : 100 (106 to 71)%	{ $0 \pm 0.5$ dB}
1.5 MHz	Check : 80 (106 to 71)%	{ $-2.0 \pm 1.0$ dB}

Frequency	Specifications for DNW-A22P	
8T BAR	Reference: 100% {0 dB}	
1.5 MHz	Adjust : 93 (102 to 85)%	{ $-0.6 \pm 0.8$ dB}
0.2 MHz	Check : 100 (106 to 71)%	{ $0 \pm 0.5$ dB}
0.5 MHz	Check : 100 (106 to 71)%	{ $0 \pm 0.5$ dB}
1 MHz	Check : 100 (106 to 71)%	{ $0 \pm 0.5$ dB}
2 MHz	Check : 80 (106 to 71)%	{ $-2.0 \pm 1.0$ dB}



DNW-A22



DNW-A22P

- (9) If the specifications are not satisfied, perform the fine adjustment so that both frequency response of R-Y and B-Y output signals satisfy the above specifications.  
 (10) Eject the alignment tape CR5-1B/CR5-1B PS.

### OXIDE Y adjustment [to step (13)]

- (11) Observe the video output signal at the composite waveform monitor.
- (12) Playback the multiburst signal portion (3:00 to 6:00) of the alignment tape CR5-2A or CR5-2A PS, and adjust that level of specified frequency by table below is satisfy the specification. And check that levels of others are satisfy the specifications.  
(DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

**Note**

The Y output is overlapped A and B channels on the composite waveform monitor. Adjust A and B channels alternately.

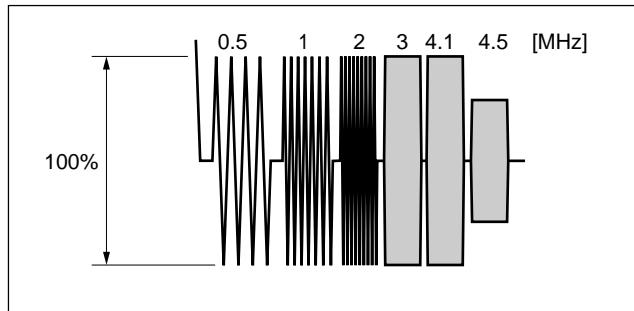
Adjustment point: A channel: A32 : DM VR 1 : EQ1 OXIDE-Y-A

B channel: A32 : DM VR 1 : EQ1 OXIDE-Y-B

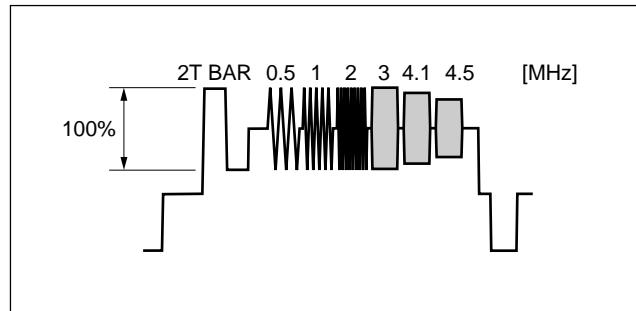
Specifications (A and B channels): Refer to table below.

Frequency	Specifications for DNW-A22
0.5 MHz	Reference: 100% {0 dB}
2 MHz	Adjust : 100 (104 to 95%) {0 $\pm 0.4$ dB}
1 MHz	Check : 100 (106 to 50%) {0 $\pm 0.5$ dB}
3 MHz	Check : 89 (106 to 50%) {-1.0 $\pm 1.5$ dB}
4.1 MHz	Check : 71 (106 to 50%) {-3.0 $\pm 3.5$ dB}

Frequency	Specifications for DNW-A22P
2T BAR	Reference: 100% {0 dB}
3 MHz	Adjust : 89 (100 to 79%) {-1.0 $\pm 1.0$ dB}
0.5 MHz	Check : 100 (106 to 50%) {0 $\pm 0.5$ dB}
1 MHz	Check : 100 (106 to 50%) {0 $\pm 0.5$ dB}
2 MHz	Check : 100 (106 to 50%) {0 $\pm 0.5$ dB}
4.1 MHz	Check : 71 (106 to 50%) {-3.0 $\pm 3.5$ dB}



DNW-A22



DNW-A22P

- (13) Playback the multiburst signal portion (3:00 to 6:00) of the alignment tape CR5-2A or CR5-2A PS, and confirm that the output level difference of A and B channels is not noticeable in high frequency (at 4.5 MHz).

**Note**

If the output level difference at 4.5 MHz is noticeable, perform the adjustment of A34 : DM VR 3 : SUB-OXIDE-A or -B. Be sure to adjust for the lower level signal only as following steps ① to ⑤ on a playing back the multiburst signal portion (3:00 to 6:00) of the alignment tape.

- ① To exit A32 : DM VR 1, push the MENU button once.
- ② Enter A34 : DM VR 3 of the maintenance mode.
- ③ Change the data value of SUB-OXIDE-Y-A (A channel side) from B2/BB, and judge a lower level channel. (DNW-A22: B2, DNW-A22P: BB)
- ④ If the B channel side is lower, return the data value of SUB-OXIDE-Y-A to B2/BB, then adjust (add to the data value) the SUB-OXIDE-Y-B until the 4.5 MHz output level of B channel is equal to the 4.5 MHz output level of A channel.  
If the A channel side is lower, adjust (add to the data value) the SUB-OXIDE-Y-A until the 4.5 MHz output level of A channel is equal to the 4.5 MHz output level of B channel.
- ⑤ To exit A34 : DM VR 3, push the MENU button once.

**OXIDE C adjustment [to step (16)]**

- (14) Observe the R-Y output signal at the oscilloscope.  
 (15) Playback the multiburst signal portion (3:00 to 6:00) of the alignment tape CR5-2A or CR5-2A PS, and adjust that level of specified frequency by table below is satisfy the specification. And check that levels of others are satisfy the specifications.  
 (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

**Note**

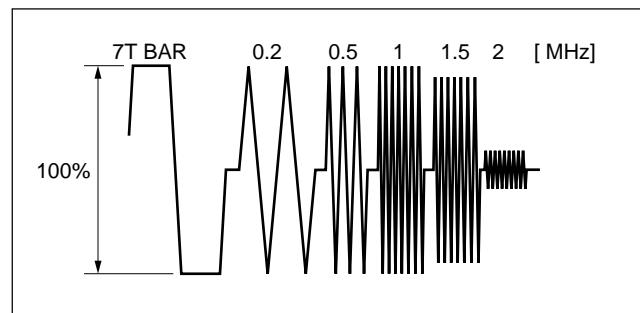
The CTDM signal is displayed on the oscilloscope. The timing order of signal is REF SYNC, R-Y, B-Y. And these signals are overlapped A and B channels. Adjust A and B channels alternately.

Adjustment point: A channel: A32 : DM VR 1 : EQ1 OXIDE-C-A  
 B channel: A32 : DM VR 1 : EQ1 OXIDE-C-B

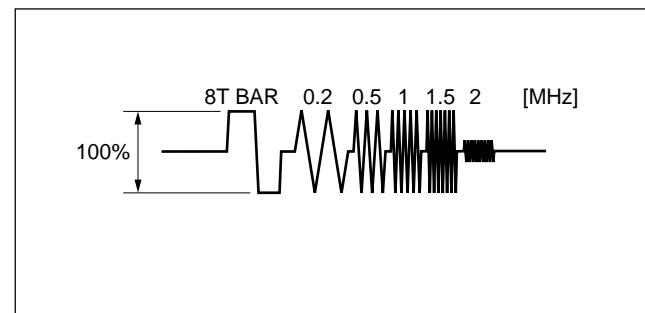
Specifications (A and B channels): Refer to table below.

Frequency	Specification for DNW-A22	
7T BAR	Reference: 100% {0 dB}	
1 MHz	Adjust : 94 (100 to 89)%	{ $-0.5 \pm 0.5$ dB}
0.2 MHz	Check : 100 (106 to 71)%	{ $0 \pm 3.0$ dB}
0.5 MHz	Check : 95 (106 to 71)%	{ $-0.4 \pm 0.8$ dB}
1.5 MHz	Check : 80 (106 to 71)%	{ $-2.0 \pm 2.5$ dB}

Frequency	Specifications for DNW-A22P	
8T BAR	Reference: 100% {0 dB}	
1 MHz	Adjust : 94 (102 to 86)%	{ $-0.5 \pm 0.8$ dB}
0.2 MHz	Check : 100 (106 to 71)%	{ $0 \pm 3.0$ dB}
0.5 MHz	Check : 100 (106 to 71)%	{ $0 \pm 3.0$ dB}
1.5 MHz	Check : 84 (106 to 71)%	{ $-1.5 \pm 2.0$ dB}



DNW-A22



DNW-A22P

- (16) If the specifications are not satisfied, perform the fine adjustment so that both frequency response of R-Y and B-Y output signals satisfy the above specifications.  
 (17) Eject the alignment tape CR5-2A/CR5-2A PS.  
 (18) To exit A32 : DM VR 1, push the MENU button once.  
**Data save [to step (21)]**  
 (19) Enter A3F : NV-RAM CONTROL of the maintenance mode, execute “SAVE ALL ADJUST DATA”.  
 (20) Check that the message “Save Complete” is displayed on the video monitor.  
 (21) To exit A3F : NV-RAM CONTROL, push the MENU button once.  
 (22) Reset S1-2/TBC-23 (C MUTE) to OFF.

## 11. Drop-out Compensation Equalizer Adjustment

## Measuring equipment: Oscilloscope

- (1) Connect and set the oscilloscope as follows:

CH-1: TP203/DM-89(G-7), DC >200 mV/DIV, 2 ms/DIV, GND: E902/DM-89(G-7)

CH-2: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)

Trigger: CH-2, - slope

- ## (2) METAL Y adjustment

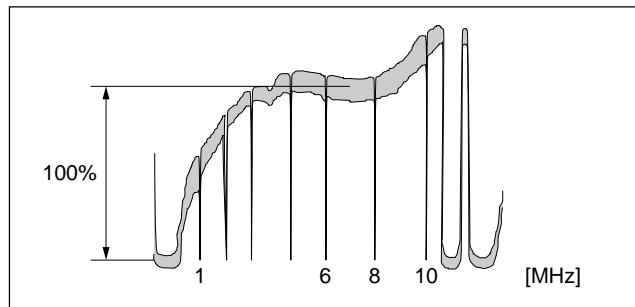
Playback the RF sweep signal portion (0:00 to 2:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: ØRV201/DM-89(G-5)

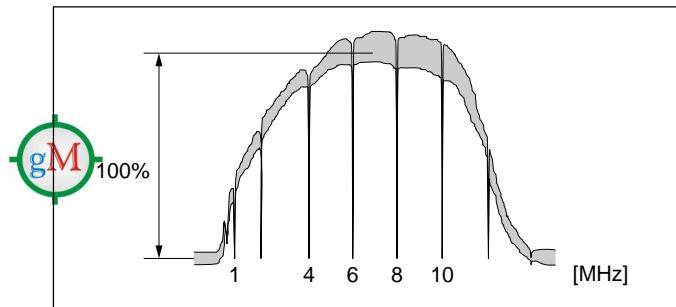
Specifications: Refer to table below.

Specifications for DNW-A22	
6 MHz	Reference: 100% {0 dB}
8 MHz	100 ±20 % {0 ±2.0 dB}
10 MHz	120 $^{+50}_{-20}$ % {2.0 $^{+5.0}_{-2.0}$ dB}

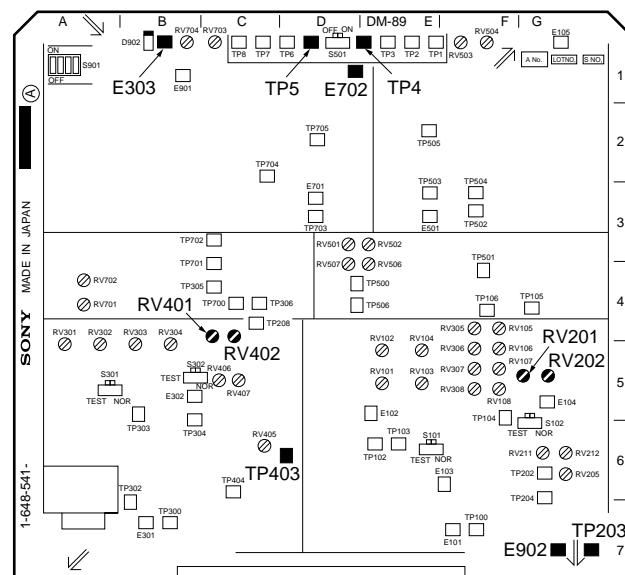
<b>Observation freq.</b>	<b>Specifications for DNW-A22P</b>
6 MHz	Reference: 100% {0 dB}
8 MHz	100 $\pm$ 20% {0 $\pm$ 2.0 dB}
10 MHz	110 $\pm$ 40% {1.0 $\pm$ 5.0 dB}



DNW-A22



DNW-A22P



DM-89 Board (A Side)

(3) Change the connection of the oscilloscope as follows:

CH-1: TP403/DM-89(D-6), GND: E303/DM-89(B-1)

CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

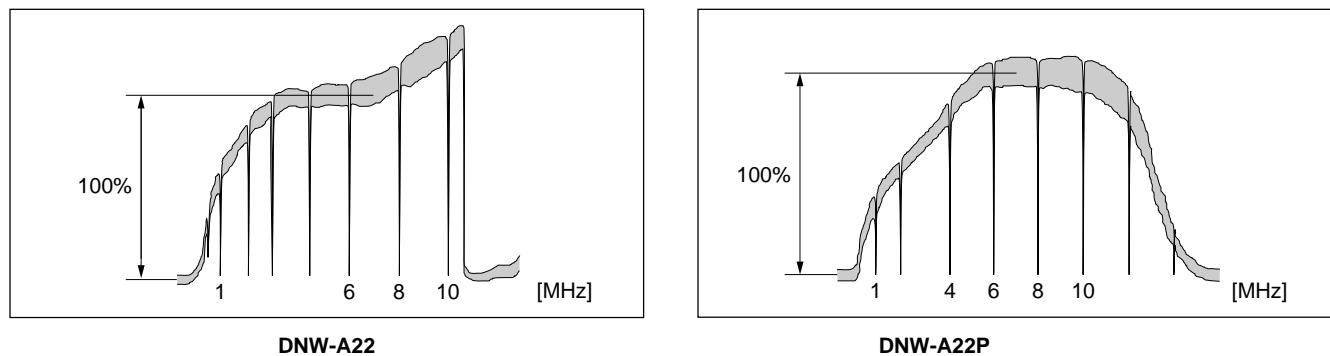
(4) METAL C adjustment

Playback the RF sweep signal portion (0:00 to 2:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: **ORV401/DM-89(G-4)**

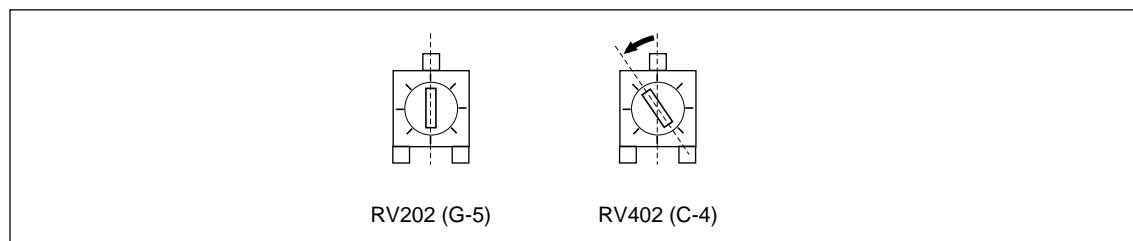
Specifications: Refer to table below.

Observation freq.	Specifications
6 MHz	Reference: 100% {0 dB}
8 MHz	100 ±20 % {0 ±2.0 dB}
10 MHz	110 $^{+40}_{-20}$ % {1.0 $^{+5.0}_{-2.0}$ dB}



(5) OXIDE Y/C adjustment

Set RVs on DM-89 board to each specified position as show below.



(6) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

**Note**

It is not necessary to eject the alignment tape when perform subsequent “12. DM RF Output Level Adjustment”.

## 12. DM RF Output Level Adjustment

Measuring equipment: Oscilloscope (Band width limit: ON)

- (1) Connect and set the oscilloscope as follows:

CH-1: TP3/DM-89(E-1), AC 100 mV/DIV, 2 ms/DIV, GND: E702/DM-89(D-1)

CH-2: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)

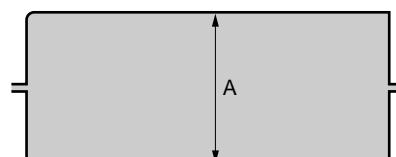
Trigger: CH-2, - slope

- ## (2) METAL Y adjustment

Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: ØRV211/DM-89(G-6)

Specification:  $A = 400 \pm 40$  mV p-p



- (3) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.

- (4) Change the connection of the oscilloscope as follows:

CH-1: TP7/DM-89(C-1), GND: E702/DM-89(D-1)

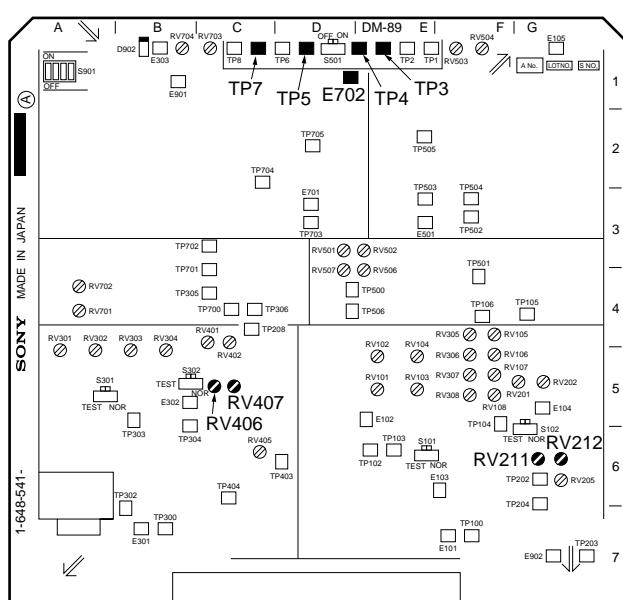
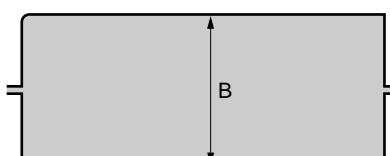
CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

- ### (5) METAL C adjustment

Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point: ORV406/DM-89(C-5)

Specification:  $B = 400 \pm 40$  mV p-p



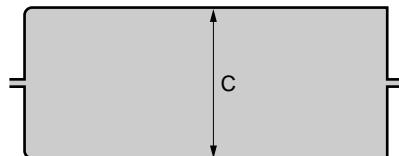
DM-89 Board (A Side)

## (7) OXIDE C adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

Adjustment point: **ORV407/DM-89(C-5)**

Specification:  $C = 400 \pm 40 \text{ mV p-p}$



## (8) Change the connection of the oscilloscope as follows:

CH-1: TP3/DM-89(E-1), GND: E702/DM-89(D-1)

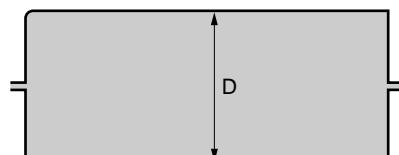
CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)

## (9) OXIDE Y adjustment

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the adjustment. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

Adjustment point: **ORV212/DM-89(G-6)**

Specification:  $D = 400 \pm 40 \text{ mV p-p}$



## (10) Eject the alignment tape CR5-2A/CR5-2A PS.

### 13. RF Envelope Adjustment

Measuring equipment: Oscilloscope

- (1) Connect and set the oscilloscope as follows:

CH-1: TP203/DM-89(G-7), DC 500 mV/DIV, 5 ms/DIV, GND: E902/DM-89(G-7)

CH-2: TP4/DM-89(E-1), DC 1 V/DIV, GND: E702/DM-89(D-1)

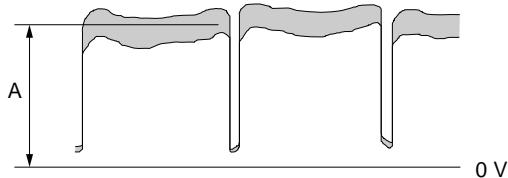
Trigger: CH-2, - slope

- (2) Y adjustment

Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point:  $\bullet$ RV205/DM-89(G-6)

Specification:  $A = 2.0 \pm 0.2$  V dc



- (3) Change the connection of the oscilloscope as follows:

CH-1: TP403/DM-89(D-6), GND: E303/DM-89(B-1)

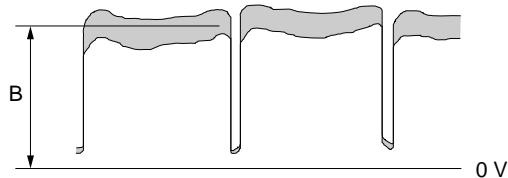
CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)

- (4) C adjustment

Playback the flat filed signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Adjustment point:  $\bullet$ RV405/DM-89(C-6)

Specification:  $B = 2.0 \pm 0.2$  V dc



- (5) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

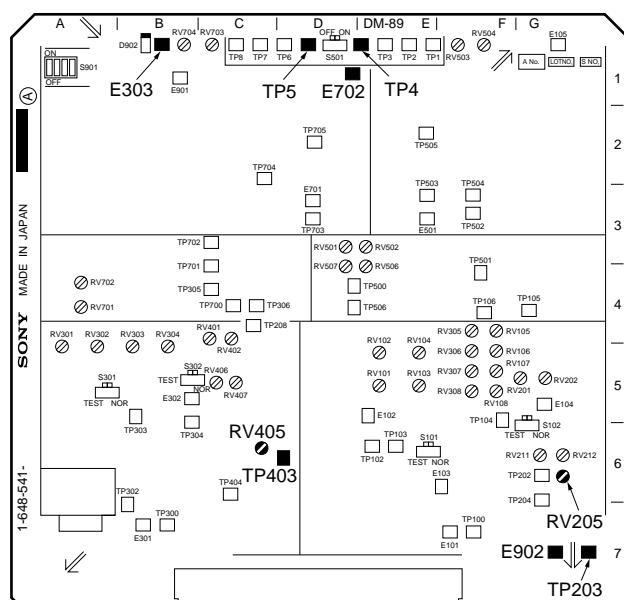
**Note**

It is not necessary to eject the alignment tape when perform subsequent "14. Search Picture Adjustment".

- (6) Enter A36 : DM VR 5 of the maintenance mode.  
(7) Setting of the threshold level  
Confirm the setting data of following items of A36 : DM VR 5.

<b>Item of A36 : DM VR 5</b>	<b>Setting data</b>
ENV-TH-H	20
ENV-TH-L	10

- (8) To exit A36 : DM VR 5, push the MENU button once.
  - (9) Data save
    - Enter A3F : NV-RAM CONTROL, execute “SAVE ALL ADJUST DATA”.
  - (10) Check that the message “Save Complete” is displayed on the video monitor.
  - (11) To exit A3F : NV-RAM CONTROL, push the MENU button once.



DM-89 Board (A Side)

## **14. Search Picture Adjustment**

Measuring equipment: Digital voltage meter and Oscilloscope

### (1) Voltage measurement

Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and measure the DC voltage level of the following measurement points with the digital voltage meter. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

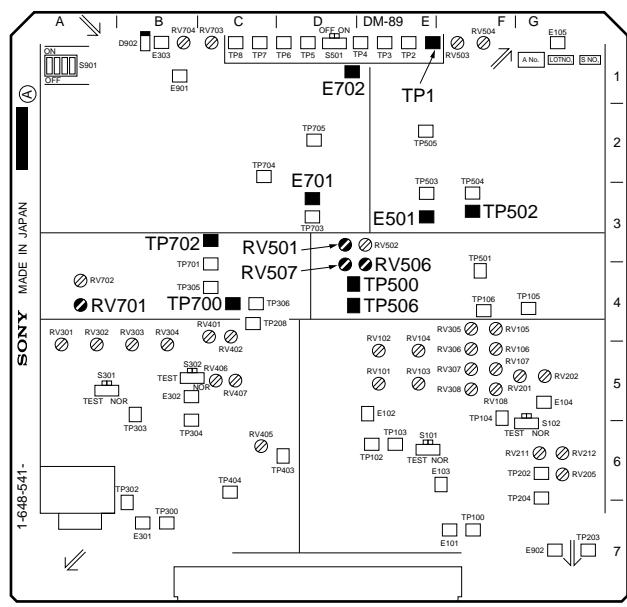
Measurement point	Measuring value (fill up)
TP500/DM-89(D-4)	
TP502/DM-89(F-3)	
TP702/DM-89(C-3)	

- (2) Turn RV507/DM-89(D-4) fully clockwise (↻).
  - (3) Short-circuits TP506/DM-89(D-4) and E501/DM-89(E-3) with a shorting clip.
  - (4) Short-circuits TP700/DM-89(C-4) and E701/DM-89(D-3) with a shorting clip.
  - (5) Voltage adjustment

Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and adjust the DC voltage level of the following measurement points with the digital voltage meter as identical to measured voltage in step (1). (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Measurement point	Adjustment point	Note
TP500/DM-89(D-4)	●RV506/DM-89(E-4)	SPD OFFSET
TP502/DM-89(F-3)	●RV501/DM-89(D-3)	Y DEEM
TP702/DM-89(C-3)	●RV701/DM-89(A-4)	C DEEM

- (6) Disconnect the shorting clip from TP506/DM-89(D-4) and E501/DM-89(E-3).
  - (7) Disconnect the shorting clip from TP700/DM-89(C-4) and E701/DM-89(D-3).



## **DM-89 Board (A Side)**

(8) Connect and set the oscilloscope as follows:

CH-1: TP1/DM-89(E-1), DC 1 V/DIV, 10  $\mu$ s/DIV, GND: E702/DM-89(D-1)

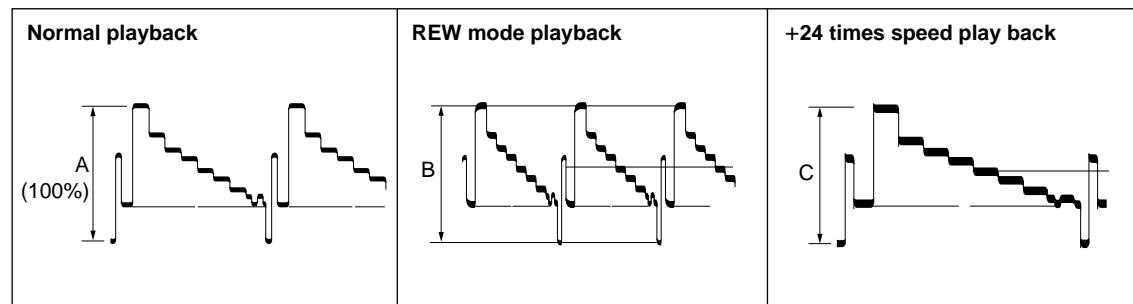
(9) Gain adjustment

Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS in the following modes, and perform the adjustment and check.

(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

### For DNW-A22

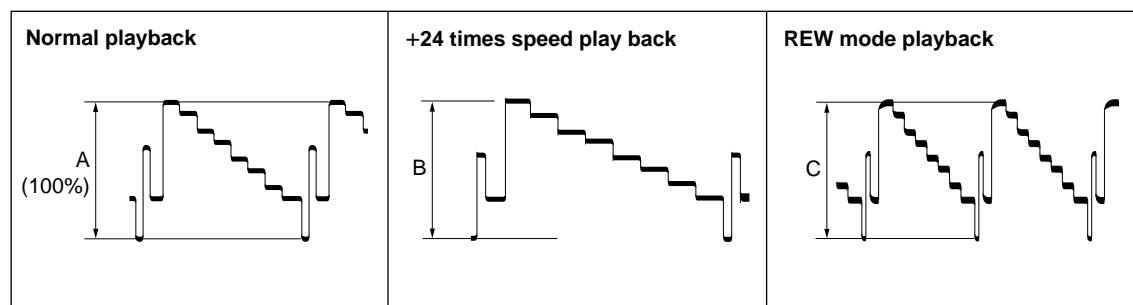
Playback mode	Specification	Adjustment point
Normal	Reference A: 100% (0 dB)	–
REW	B = 100 $\pm$ 3 % (0 $\pm$ 0.2 dB)	•RV507/DM-89(D-4)
+24 times speed	C = 100 $\pm$ 10 % (0 $\pm$ 1.0 dB)	Check only



DNW-A22

### For DNW-A22P

Playback mode	Specification	Adjustment point
Normal	Reference A: 100% (0 dB)	–
+24 times speed	B = 105 $\pm$ 5 % (0.4 $\pm$ 0.4 dB)	•RV507/DM-89(D-4)
REW	C = 100 $\pm$ 10 % (0 $\pm$ 1.0 dB)	Check only



DNW-A22P

(10) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

**Note**

It is not necessary to eject the alignment tape when perform subsequent “15. Guard Band Width Adjustment”.

## 15. Guard Band Width Adjustment

Measuring equipment: Video monitor

- (1) Enter A35 : DM VR 4 of the maintenance mode
- (2) Confirm the setting data of following items of A35 : DM VR 4.

**Note**

Some setting data are different according to the board number suffix (XX of 1-648-541-XX) of DM-89 board.

Item of A35 : DM VR 4	Setting data for DNW-A22		Setting data for DNW-A22P	
	Suffix-13	Suffix-14 and higher	Suffix-13	Suffix-14 and higher
GUARD BAND METAL-Y	38	1D	29	27
GUARD BAND METAL-C	21	1C	16	23
GUARD BAND OXIDE-Y	48	32	3B	2F
GUARD BAND OXIDE-C	30	31	16	29

- (3) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS in the JOG mode. (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)
- (4) Turn the search dial until guard band appears at the center on the video monitor screen.  
(Refer to Figure 1 on next page.)
- (5) METAL, Guard band width confirmation  
Confirm that the guard band width is satisfied the following specifications. When the specifications are satisfied, go to step (8). If not, perform step (6) or (7).  
Specification 1: Guard band width is below a third of video display screen.  
Specification 2: Guard band width of C side > Guard band width of Y side
- (6) If the specification 1 is not satisfied:  
Subtract 1 from each data value of GUARD BAND METAL-Y and GUARD BAND METAL-C, then perform the confirmation of step (5) again.
- (7) If the specification 2 is not satisfied:  
Add 1 to the data value of GUARD BAND METAL-C, then perform the confirmation of step (5) again.
- (8) METAL C confirmation  
Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS in the VARIABLE +1 time speed mode (or the search +1 time speed), and confirm the following specification. When the specification is satisfied, go to step (10). If not, perform step (9).  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)  
Specification 3: The picture (color-bar) on the video monitor is colored.  
(The C signal is not fully muted.)
- (9) If the specification 3 is not satisfied:  
Subtract 1 from the data value of GUARD BAND METAL-C, then perform the confirmation of step (8) again.
- (10) Eject the alignment tape CR5-1B/CR5-1B PS.

- (11) Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS in the JOG mode. (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)
- (12) Turn the search dial until guard band appears at the center on the video monitor screen.  
(Refer to Figure 1.)
- (13) OXIDE, Guard band width confirmation  
Confirm that the guard band width is satisfied the following specifications. When the specifications are satisfied, go to step (16). If not, perform step (14) or (15).
  - Specification 1: Guard band width is below a half of video display screen.
  - Specification 2: Guard band width of C side > Guard band width of Y side
- (14) If the specification 1 is not satisfied:  
Subtract 1 from each data value of GUARD BAND OXIDE-Y and GUARD BAND OXIDE-C, then perform the confirmation of step (13) again.
- (15) If the specification 2 is not satisfied:  
Add 1 to the data value of GUARD BAND OXIDE-C, then perform the confirmation of step (13) again.
- (16) OXIDE C confirmation  
Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS in the VARIABLE +1 time speed mode (or the search +1 time speed), and confirm the following specification. When the specification is satisfied, go to step (18). If not, perform step (17).
  - (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)
  - Specification 3: The picture (color-bar) on the video monitor is colored.  
(The C signal is not fully muted.)
- (17) If the specification 3 is not satisfied:  
Subtract 1 from the data value of GUARD BAND OXIDE-C, then perform the confirmation of step (16) again.
- (18) Eject the alignment tape CR5-2A/CR5-2A PS.
- (19) To exit A35 : DM VR 4, push the MENU button once.
- (20) Data save  
Enter A3F : NV-RAM CONTROL of the maintenance mode, execute “SAVE ALL ADJUST DATA”.
- (21) Check that the message “Save Complete” is displayed on the video monitor.
- (22) To exit A3F : NV-RAM CONTROL, push the MENU button once.
- (23) To exit the maintenance mode, push the MENU button three time again.

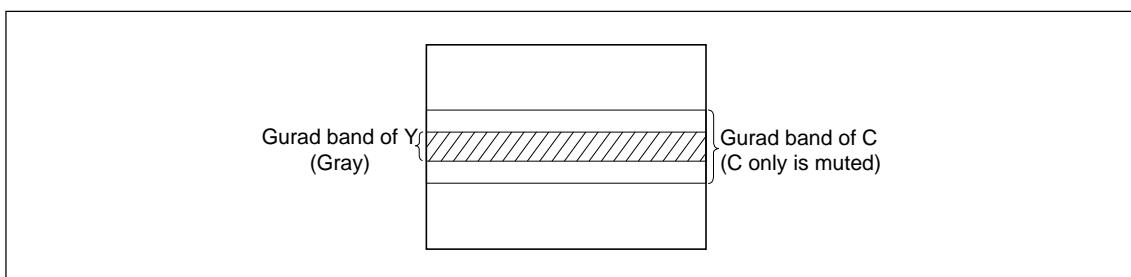


Figure 1. Guard Band

**Note**

The menu of the maintenance mode is superimposed on picture on the video monitor in fact. If the superimposed picture obstructs the maintenance operation, set the CHARACTER switch on the sub control panel to OFF. (Be sure to return it to ON after the maintenance operation is completed.)

## 16. Composite Output Level Adjustment

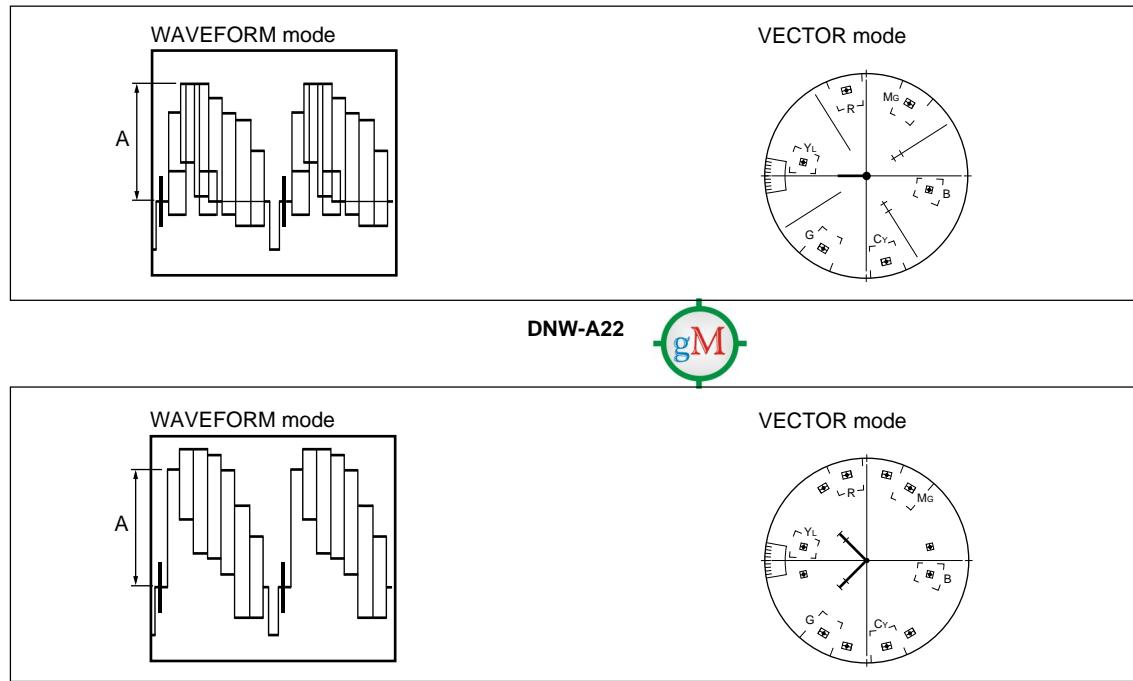
Measuring equipment: Composite waveform/vector monitor (terminated with  $75\ \Omega$ )

### (1) METAL level adjustment

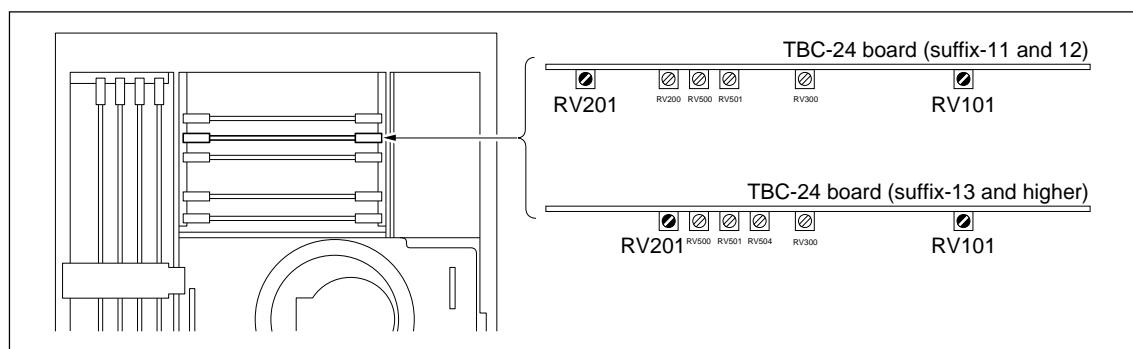
Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment of each composite signal level.

(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

Equipment setting	Specifications	Adjustment point
WAVEFORM mode	DNW-A22: $A = 714 \pm 7\text{ mV}$ ( $100 \pm 1\text{ IRE}$ ) DNW-A22P: $A = 700 \pm 7\text{ mV}$	RV101/TBC-24(F-1)
VECTOR mode	Inside the corresponding frames (DP: $\pm 2.5^\circ$ , DG: $\pm 2.5\%$ )	RV201/TBC-24(A/B-1)



### (2) Eject the alignment tape CR5-1B/CR5-1B PS.



RV101 and RV201 on TBC-24 Board

### Note

RV101 and RV201 on TBC-24 board are possible to adjust without using the extension board.

### (3) OXIDE Y/C confirmation

Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the check of each composite signal level. If the specification is not satisfied, perform the adjustment of the composite output level.

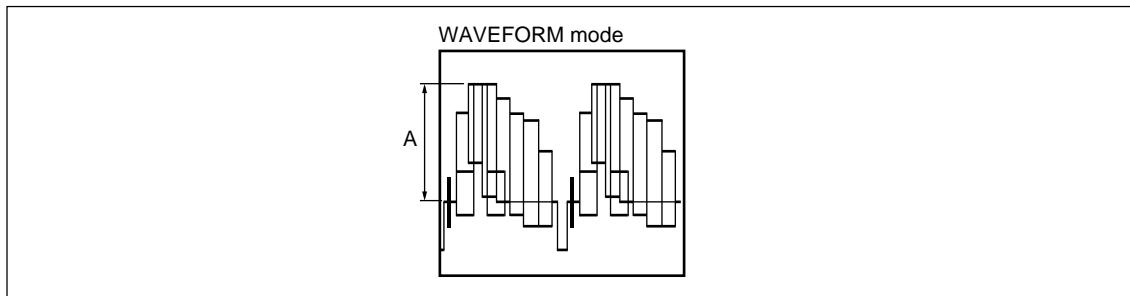
(DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

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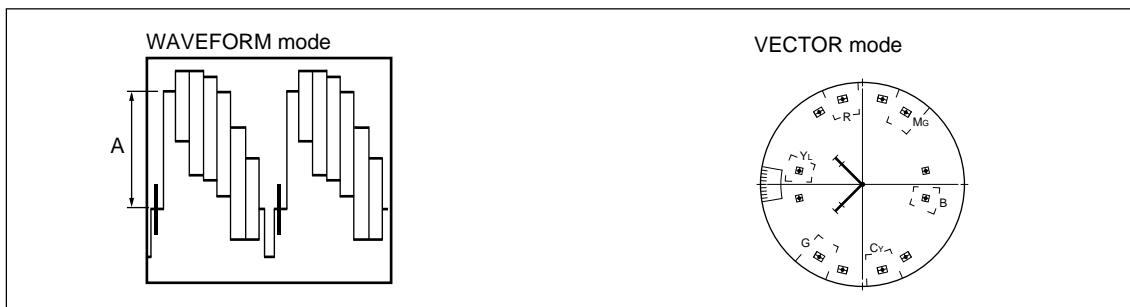
## Note

For DNW-A22, perform the check (adjustment) for Y signal only.

Equipment setting	Specifications	Adjustment point
WAVEFORM mode	DNW-A22: A = $714 \pm 7$ mV (100 $\pm 1$ IRE) DNW-A22P: A = $700 \pm 7$ mV	●RV504/DM-89(F-1)
VECTOR mode	Inside the corresponding frames (DP: $\pm 2.5^\circ$ , DG: $\pm 2.5\%$ )	●RV704/DM-89(B-1) DNW-A22P only

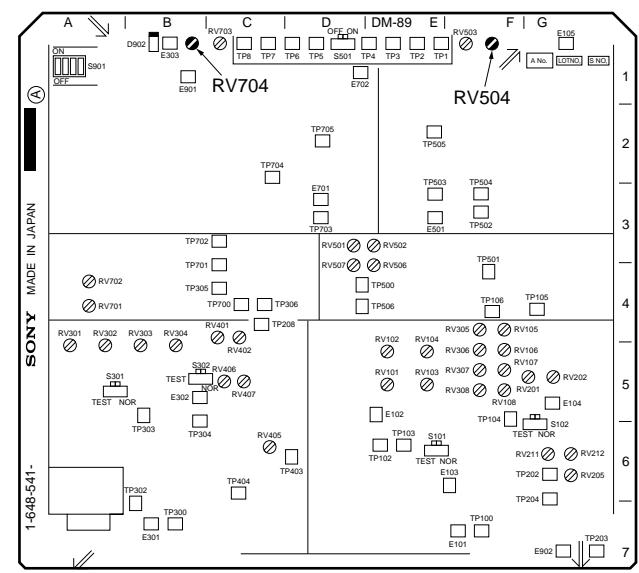


DNW-A22



DNW-A22P

(4) Eject the alignment tape CR5-2A/CR5-2A PS.



DM-89 Board (A Side)

## 6-4. EQ-56 Board Replacement

The electrical adjustments are essential after the EQ-56 board is replaced.

To perform the electrical adjustments, the following equipment and fixtures are required.

- Oscilloscope: TEKTRONIX 2465B or equivalent
- Composite video monitor (to display of the maintenance mode)
- Extension board: EX-377 (SONY part No. J-6269-810-A) for DM-89 board extension
- Alignment tape(s)
- For DNW-A22: SR5-1 (SONY part No. 8-960-075-01),  
CR5-1B (SONY part No. 8-960-096-41), and  
CR5-2A (SONY part No. 8-960-097-44)
- For DNW-A22P: SR5-1P (SONY part No. 8-960-075-51),  
CR5-1B PS (SONY part No. 8-960-096-91), and  
CR5-2A PS (SONY part No. 8-960-097-44)

### 6-4-1. Replacement Procedure

#### Note

Turn off the POWER switch before starting the replacement.

- (1) Remove the upper lid, board retainer (S), and EQ-56 (original) board.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”. )
- (2) Disconnect the harnesses to the EQ-56 (original) board, then connect them to the EQ-56 (new) board.
- (3) Insert the EQ-56 (new) board.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”. )
- (4) Extend the DM-89 board with the EX-377 extension board.
- (5) Clean the video heads.  
(Refer to “5-2-5. Tape Running Surface of Upper Drum and Video Heads Cleaning”).)
- (6) Set the CHARACTER switch on the sub control panel to ON.
- (7) Perform the electrical adjustment (Section 6-5-2).
- (8) Turn off the power.
- (9) Remove the DM-89 board from the extension board, then pull out the extension board.
- (10) Insert the DM-89 board.
- (11) Install the board retainer (S).  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”. )
- (12) Install the upper lid.
- (13) Return the CHARACTER switch state to previous state.

## 6-4-2. Electrical Adjustments

### Adjustment Items

No.	Item	Adjustment point	Notes
0	Preparation		
1	All RF system adjustment	A17 : A11-A16 ALL ADJUST Data save	Automatically adjustment A1F : NV-RAM CONTROL
2	EQ RF output level adjustment for BETACAM/BETACAM SP PB	METAL Y : A30 : EQ VR : RF GAIN METAL-Y-A A30 : EQ VR : RF GAIN METAL-Y-B METAL C : A30 : EQ VR : RF GAIN METAL-C-A A30 : EQ VR : RF GAIN METAL-C-B OXIDE C : A30 : EQ VR : RF GAIN OXIDE-C-A A30 : EQ VR : RF GAIN OXIDE-C-B OXIDE Y : A30 : EQ VR : RF GAIN OXIDE-Y-A A30 : EQ VR : RF GAIN OXIDE-Y-B Data save	TP100/DM-89 TP300/DM-89 TP300/DM-89 TP100/DM-89 A3F : NV-RAM CONTROL

### For Maintenance Mode

Describes the operation of the maintenance mode as follows:

#### How to enter the maintenance mode

Push S1101(G-1) on the SS-63 board.

#### How to enter the next menu

- (1) Push the JOG button. = **Search dial enters into the JOG mode.**
- (2) To set the cursor (\* mark) to the desired menu (mode), turn the search dial.
- (3) Push the SET button once.

#### How to exit the current menu (mode)

Push the MENU button once.

**Note**

If the MENU button is pushed several times, the maintenance mode exits.

#### How to change the data value (for manual adjustment only)

- (1) To set the cursor (\* mark) to the item, turn the search dial.
- (2) Turn the search dial slowly while pressing the JOG button. = **Data value changes.**  
REVERSE direction: decrease the data value (00's next is FF)  
FORWARD direction: increase the data value (FF's next is 00)

**Note**

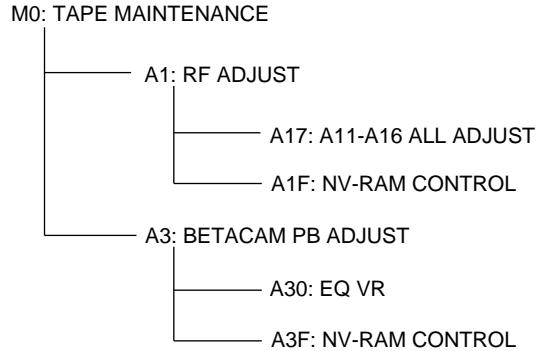
During adjustment, change the rotational direction of the search dial according to the change of waveform that is displayed on the measuring equipment.

### How to save the data

- (1) To set the cursor (\* mark) to A?F : NV-RAM CONTROL (A1F or A3F), turn the search dial.
- (2) Push the SET button once.
- (3) To set the cursor (\* mark) to “SAVE ALL ADJUST DATA”, turn the search dial.
- (4) Push the SET button once.

#### Note

The sub modes and menus of the maintenance mode that are used after replacing the EQ-56 board are as shown below.



---

### 0. Preparation

- (1) Connect the video monitor to the VIDEO OUTPUT COMPOSITE 3 connector.
- (2) Wait for more than 20 minutes after turning on the power.

---

## 1. All RF System Adjustment

- (1) Insert the alignment tape SR5-1/SR5-1P, then search the alignment tape 00:01:00 in time cord.  
(DNW-A22: SR5-1, DNW-A22P: SR5-1P)
- (2) To enter the maintenance mode, push S1101(G-1) on the SS-63 board.
- (3) Enter A17 : A11-A16 ALL ADJUST in the maintenance mode.
  - Displays “Auto Adjust (Push SET)” on the video monitor.
- (4) Push the SET button on the lower control panel.
  - Starts the automatically adjustment.
  - Displays “Auto Adjust Complete” on the video monitor after the automatically adjustment is completed.
- (5) To exist A17 : A11-A16 ALL ADJUST, push the MENU button on the lower control panel.
- (6) Enter A1F : NV-RAM CONTROL.
- (7) Execute “SAVE ALL ADJUST DATA”.
  - Displays “Save Complete” on the video monitor after the data save is completed.
- (8) To exist the maintenance mode, push the MENU button four times.
- (9) Eject the alignment tape SR5-1/SR5-1P.

---

## 2. EQ RF Output Level Adjustment for BETACAM/BETACAM SP PB

Measuring equipment: Oscilloscope (Band width limit: ON)

- (1) To enter the maintenance mode, push S1101(G-1) of SS-63 board.
- (2) Enter A3 : BETACAM PB ADJUST of the maintenance mode.
- (3) Enter A30 : EQ VR.
- (4) Set the specified data to all items of A30 : EQ VR.

Item of A30 : EQ VR	Setting data for DNW-A22	Setting data for DNW-A22P
RF GAIN METAL-Y-A	55	8E
RF GAIN METAL-Y-B	55	8E
RF GAIN METAL-C-A	3F	6C
RF GAIN METAL-C-B	3F	6C
RF GAIN OXIDE-Y-A	72	9C
RF GAIN OXIDE-Y-B	72	9C
RF GAIN OXIDE-C-A	5A	81
RF GAIN OXIDE-C-B	5A	81

(5) Connect and set the oscilloscope as follows:

CH-1: TP100/DM-89(F-7), AC 100 mV/DIV, 2 ms/DIV, GND: E101/DM-89(F-7)

CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1), trigger channel

(6) To perform the alignment tape operation, push the SET button once.

(7) Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS.

(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

(8) To operate the maintenance mode, push the MENU button once.

(9) Perform the METAL Y adjustment.

**Note**

Adjust each signal of Y-A and Y-B channels.

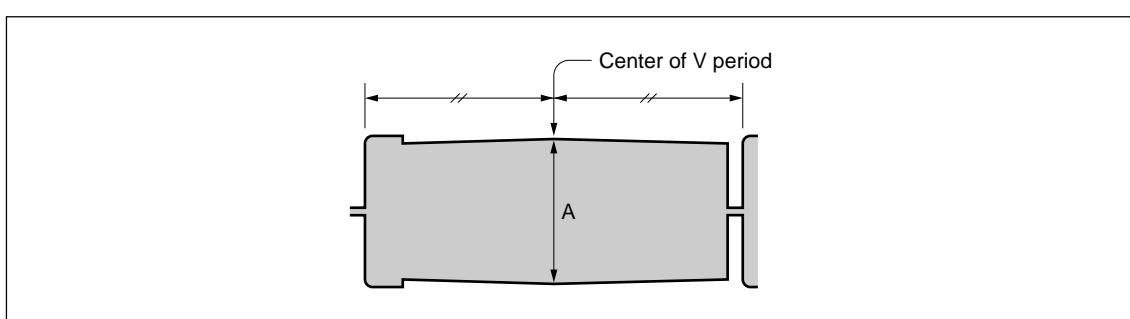
Set the trigger of oscilloscope to - slope before adjusting the Y-A channel.

Set to + slope before adjusting the Y-B channel.

Adjustment points: Y-A channel: A30 : EQ VR : RF GAIN METAL-Y-A

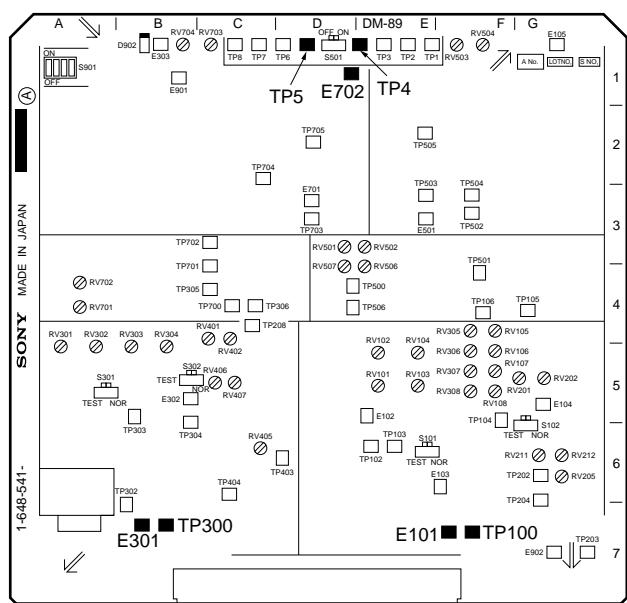
Y-B channel: A30 : EQ VR : RF GAIN METAL-Y-B

Specifications (Y-A and Y-B channels): A =  $380 \pm 20$  mV p-p



(10) To perform the tape operation, push the SET button once.

(11) Stop the playback of the alignment tape CR5-1B/CR5-1B PS.



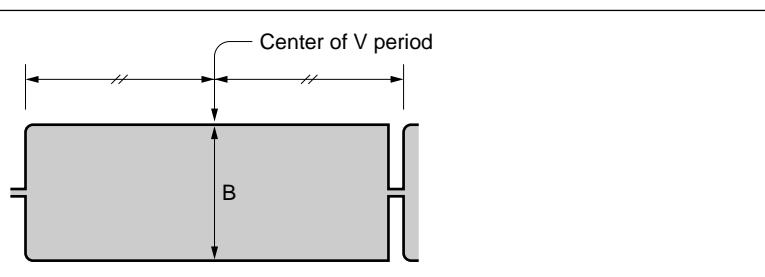
- (12) Change the connection of the oscilloscope as follows:  
 CH-1: TP300/DM-89(B-7), GND: E301/DM-89(B-7)  
 CH-2: TP5/DM-89(D-1), GND: E702/DM-89(D-1)
- (13) Playback the flat field signal portion (24:00 to 26:00) of the alignment tape CR5-1B or CR5-1B PS.  
 (DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)
- (14) To operate the maintenance mode, push the MENU button once.
- (15) Perform the METAL C adjustment.

**Note**

Adjust each signal of C-A and C-B channels. Set the trigger of oscilloscope to – slope before adjusting the C-A channel. Set to + slope before adjusting the C-B channel.

Adjustment points: C-A channel: A30 : EQ VR : RF GAIN METAL-C-A  
 C-B channel: A30 : EQ VR : RF GAIN METAL-C-B

Specifications (C-A and C-B channels):  $B = 380 \pm 20 \text{ mV p-p}$



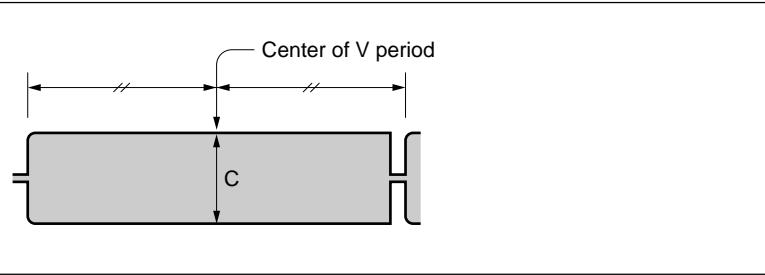
- (16) To perform the tape operation, push the SET button once.
- (17) Stop the playback of the alignment tape CR5-1B/CR5-1B PS, and eject it.
- (18) Playback the flat field signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS.  
 (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)
- (19) To operate the maintenance mode, push the MENU button once.
- (20) Perform the OXIDE C adjustment.

**Note**

Adjust each signal of C-A and C-B channels. Set the trigger of oscilloscope to – slope before adjusting the C-A channel. Set to + slope before adjusting the C-B channel.

Adjustment points: C-A channel: A30 : EQ VR : RF GAIN OXIDE-C-A  
 C-B channel: A30 : EQ VR : RF GAIN OXIDE-C-B

Specifications (C-A and C-B channels):  $C = 250 \pm 20 \text{ mV p-p}$



- (21) To perform the tape operation, push the SET button once.
- (22) Stop the playback of the alignment tape CR5-2A/CR5-2A PS.

- (23) Change the connection of the oscilloscope as follows:
    - CH-1: TP100/DM-89(F-7), GND: E101/DM-89(F-7)
    - CH-2: TP4/DM-89(E-1), GND: E702/DM-89(D-1)
  - (24) Playback the flat field signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS.  
(DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)
  - (25) To operate the maintenance mode, push the MENU button once.
  - (26) Perform the OXIDE Y adjustment.

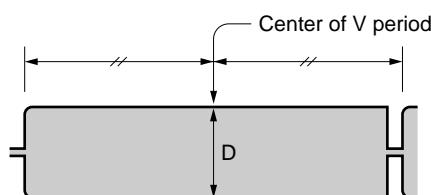
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## Note

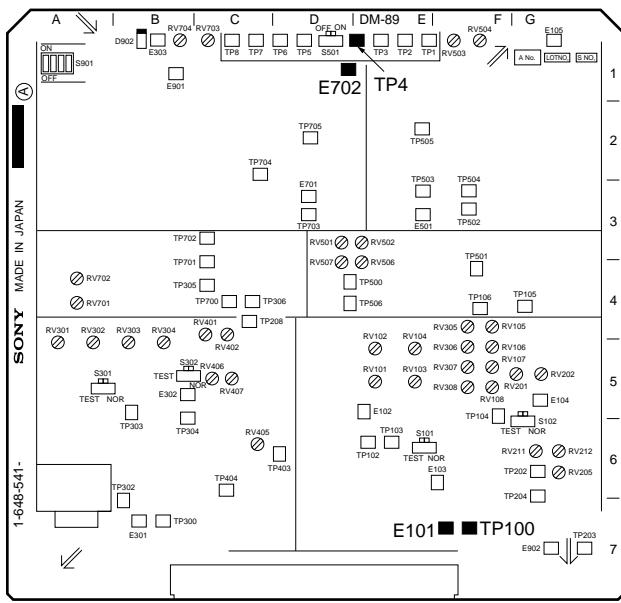
Adjust each signal of Y-A and Y-B channels. Set the trigger of oscilloscope to  $-$  slope before adjusting the Y-A channel. Set to  $+$  slope before adjusting the Y-B channel.

Adjustment points: Y-A channel: A30 : EQ VR : RF GAIN OXIDE-Y-A  
Y-B channel: A30 : EQ VR : RF GAIN OXIDE-Y-B

Specifications (Y-A and Y-B channels):  $D = 250 \pm 20$  mV p-p



- (27) To perform the tape operation, push the SET button once.
  - (28) Stop the playback of the alignment tape CR5-2A/CR5-2A PS, and eject it.
  - (29) To operate the maintenance mode, push the MENU button once.
  - (30) To exit A30 : EQ VR, push the MENU button once again.
  - (31) Data save
    - Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
  - (32) Check that the message “Save Complete” is displayed on the video monitor.
  - (33) To exit the maintenance mode, push the MENU button four times.



DM-89 Board (A Side)

## 6-5. SS-63 Board Replacement

For the board replacement, refer to “6-1-3. Pulling out/Insertion of Plug-in Board”.

However, the following service operations are required in before and after the SS-63 board replacement.

### Note

The SS-63 board of the board numbers 1-661-127-11 and 1-661-127-12 cannot be used to DNW-A22/A22P. Be sure to confirm the suffix of board number. The board number is indicated on the left margin (A-6) of A side.

### Before replacement

- Check the setting of setup menu (Main menu and Extended menu of 525/60 and 625/50 line systems)  
Record the setting of setup menu to a copy of the setting check sheet in Appendix A, if possible.
- Setting of the DIP switches  
Set the DIP switches (S101, S1100, S1102, and S1900) according to the model.  
Refer to Section 6-5-1 for detail.

### After replacement

- Setting of setup menu (Main menu and Extended menu of 525/60 and 625/50 line systems)  
Reset the setup menu as recorded setting on the setting check sheet (copy).
- Error logging data clear and Calendar/Clock setting  
There is a possibility that the SS-63 board to be installed has the another error logging data in its NV-RAM.  
Therefore, clear the error logging data.

And, the calendar/clock are required to indicate of the day and time at error occurrence. There is a possibility that the date and time are wrong. Set the calendar/clock to the correct day and time.

Refer to Section 6-5-2 for detail.

### Note

The NV-RAM on the SS-63 board has the calendar and clock data.

- Setting of the serial number  
Set the serial number with C41 : SERIAL NUMBER of the maintenance mode. (Refer to Section 4-2-6.)

### 6-5-1. Setting of DIP Switches

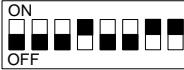
#### Notes

- The “■” mark shows the knob position.
- For detailed description of each DIP switch, refer to Section 1-10-5.

- Setting the DIP switch S1102 (F-2) as follows:

#### Note

Setting is different according to the model.

Model	Setting
DNW-A22	
DNW-A22P	

- Confirm that the DIP switches S101(A-1), S1100(J-1), and S1900(P-1) are following settings.

Ref. No.	Setting	Remarks
S101		This setting is the factory setting.
S1100		See below notes.
S1900		All OFF

#### Notes

- After completing the setting of setup menu, be sure to set the switch No. 1 of S1100 to identical setting as the SS-63 board that is removed.
- Be sure to set the switch No. 2 of S1100 to identical setting as the SS-63 board that is removed.

## 6-5-2. Error Logging Data Clear and Calendar/Clock Setting

Clear the another error logging data in NV-RAM on the SS-63 board that is installed, and set the calendar/clock to the correct day and time.

Clear and set the data as follows after entering the error logger display mode.

- (1) Enter the error logger display mode.

(Enter the maintenance mode, then enter M2 : ERROR LOGGER.)

**Note**

Contents of the error logger are superimposed on the video monitor connected to the VIDEO OUTPUT COMPOSITE 2 connector.

### Error logging data clear [step (2)]

- (2) Push the RESET button once on the lower control panel while pressing the STOP button.

### Calendar/Clock setting [steps (3) through (8)]

- (3) Push the SET button once on the lower control panel while pressing the STOP button.

**Note**

After pushing the SET button once, displays the setting menu on lower half part of the superimposed screen, and cursor (\* mark) moves to the setting menu.

- (4) Turn the search dial to FORWARD direction (↻) until the value for year on last line (calendar and clock) blinks.

**Note**

The \* mark is not displayed on the line of the calendar and clock.

- (5) Blink the value of changing (setting) item (year, month, day, hour, minute, or second) by turning the search dial.
- (6) Change its item to a desired value by turning the search dial while pressing the JOG button on the lower control panel.

**Notes**

- Change the value, then displays message “Push SET button”.  
And stops a step forward of the calendar/clock.
- If canceling that setting (return to previous value), don’t push the SET button, push the MENU button.

When pushing the MENU button once, exits the setting menu.

- (7) Repeat steps (5) and (6) until changing the all values of the requisite items.

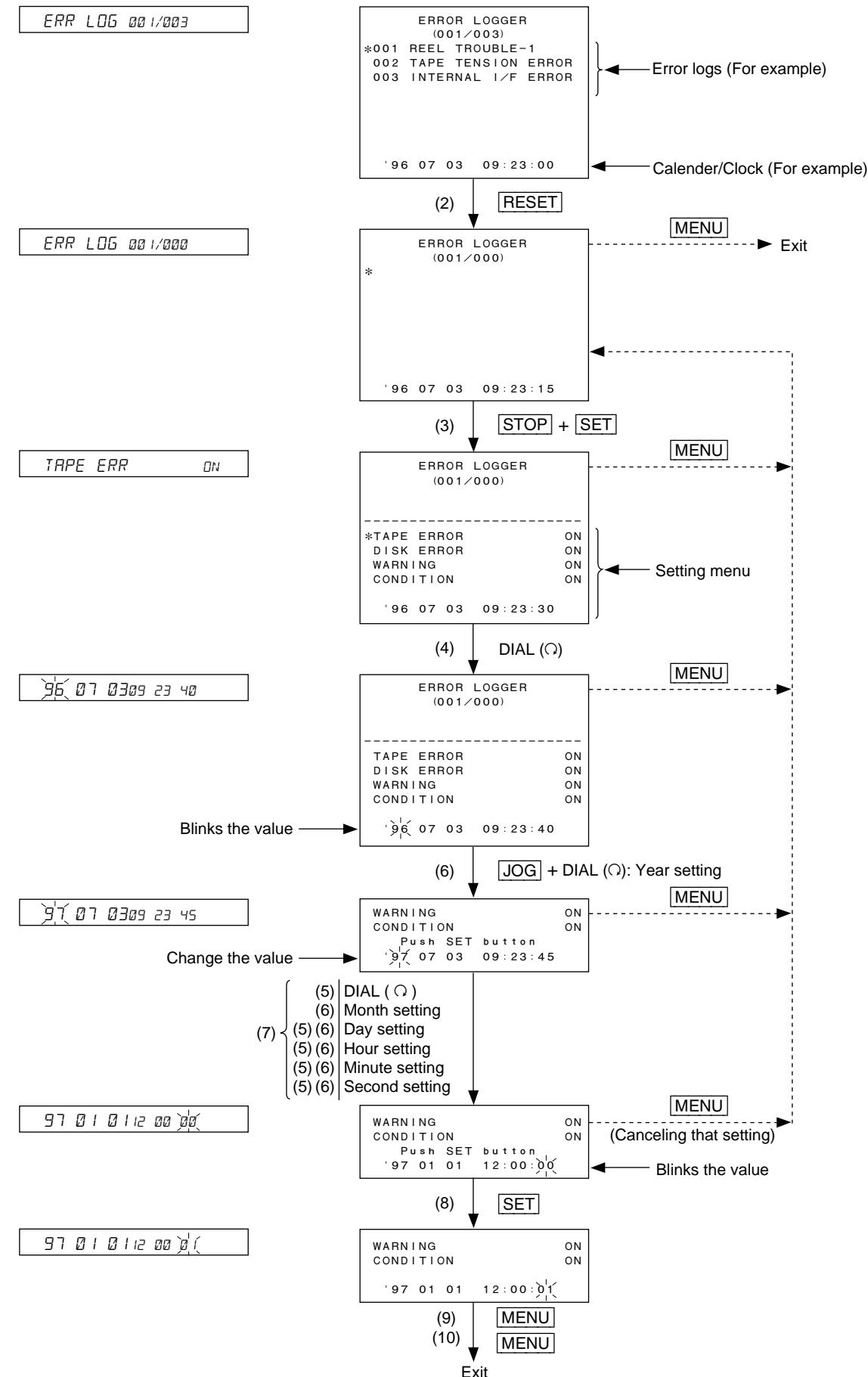
- (8) To save the setting, push the SET button once on the lower control panel.

- (9) Push the MENU button once to exit the setting menu.

- (10) To exit the error logger display mode, push the MENU button once again.

**Note**

When entering the error logger display mode from the maintenance mode, returns the maintenance mode screen. Exits the maintenance mode by pushing the MENU button once again.



## 6-6. TBC-23 Board Replacement

The electrical adjustments are essential after the TBC-23 board is replaced.

To perform the electrical adjustment, the following equipment and fixtures are required.

### Note

The TBC-23 board of the service parts code suffix-A cannot be used to this unit. Be sure to confirm the suffix of service parts code before replacement. The service parts code is indicated on near the top right corner (F-2) of A side of TBC-23 board.

For the TBC-23 board of the board number 1-648-543-13 or 1-648-543-14, modification is required.

Please consult with local Sony's sales/service office in detail. The board number is indicated on the left margin (A-6) of A side of TBC-23 board.

- Composite waveform/vector monitor  
For DNW-A22: TEKTRONIX 1780R or equivalent (With LINE SELECT)  
For DNW-A22P: TEKTRONIX 1781R or equivalent (With LINE SELECT)
- VISC phase adjusting tool  
For DNW-A22P only: (SONY part No. J-6332-240-A)
- Composite video monitor
- 75 Ω terminators (1 piece)
- Cleaning tape BCT-5CLN (SONY standard products)
- Alignment tapes
- For DNW-A22: CR5-1B (SONY part No. 8-960-096-41) and  
CR5-2A (SONY part No. 8-960-097-44)
- For DNW-A22P: CR5-1B PS (SONY part No. 8-960-096-91) and  
CR5-2A PS (SONY part No. 8-960-098-44)

### 6-6-1. Replacement Procedure

### Note

Turn off the POWER switch before starting the replacement.

- (1) Remove the upper lid, board retainer (S), and TBC-23 (original) board.  
(Refer to "6-1-3. Plug-in Board Pulling out/Insertion".)
- (2) Inserting a new TBC-23 board to the slot for TBC-23 board.
- (3) Connect the one disconnected harness to CN1 on the TBC-23 (new) board.
- (4) Clean the video heads by cleaning tape. (Refer to "5-2-1. Cleaning by Cleaning Tape".)
- (5) Perform the electrical adjustments (Section 6-6-2).
- (6) For DNW-A22 only  
Return the ITEM-709 and ITEM-713 of setup extend menu to previous settings after the electrical adjustments are completed.
- (7) Return the states of S1100-1 on the SS-63 board and control panels to their previous states.
- (8) Turn off the power.
- (9) Install the board retainer (S) and upper lid. (Refer to Section 6-1-3. )

## 6-6-2. Electrical Adjustments

### Adjustment Items

No.	Item	Adjustment point	Notes
0	Preparation		
1	Initial data setting	All items of A37 : TBC VR Data save A3F : NV-RAM CONTROL	
2	PB video phase confirmation (Note 1)	– ORV300/TBC-24 A37 : TBC VR : SQ Y RZ (Note 2)	VIDEO OUTPUT COMPOSITE 1 VIDEO OUTPUT COMPOSITE 1
3	TBC Y/C delay confirmation (Note 1)	– METAL ORV500/TBC-24 A37 : TBC VR : SQ C RZ (Note 3) ORV504/TBC-24 (Note 4)	VIDEO OUTPUT COMPOSITE 1 VIDEO OUTPUT COMPOSITE 1
	OXIDE	ORV501/TBC-24	VIDEO OUTPUT COMPOSITE 1
4	VISC phase adjustment	ORV200/TBC-23 A37 : TBC VR : VISC PHASE	VIDEO OUTPUT COMPOSITE 1 VIDEO OUTPUT COMPOSITE 1
	Data save	A3F : NV-RAM CONTROL	

Note 1: If the specification is not satisfied, adjust the TBC-24 board.

Note 2: If the specification is not satisfied by RV300/TBC-24, change the data of A37: TBC VR: SQ Y RZ.

Note 3: If the specification is not satisfied by RV500/TBC-24, change the data of A37: TBC VR: SQ C RZ.

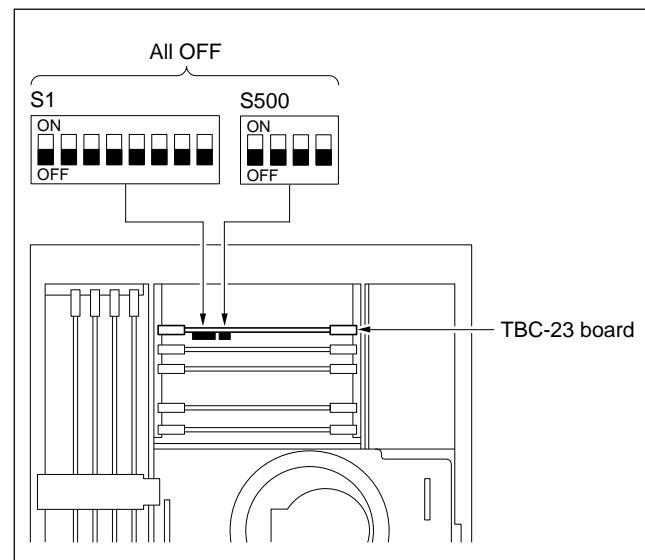
Note 4: This RV504 is equipped with the board number suffixes 13 and higher of TBC-24 board.

### 0. Preparation

#### Setting (Check) of the switches on the TBC-23 board

Confirm that the switches on TBC-23 board are factory settings.

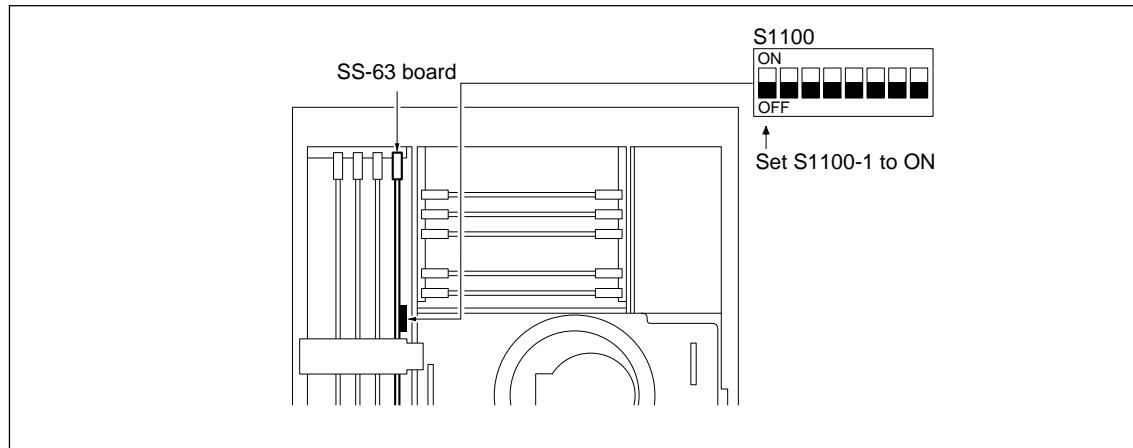
Ref. No.	Switch No.	Factory setting
S1	1	OFF
	2	OFF
	3	OFF
	4	OFF
	5	OFF
	6	OFF
	7	OFF
	8	OFF
S500	1	OFF
	2	OFF
	3	OFF
	4	OFF



S1 and S500 of TBC-23 Board

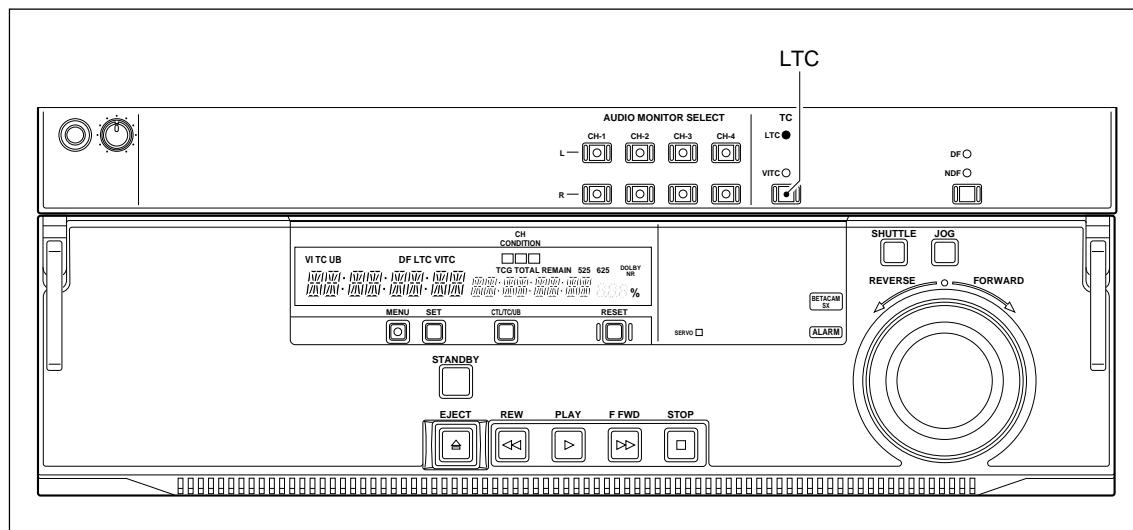
### Setting of DNW

- (1) Set S1100-1 on SS-63 board to ON to treat the extended menu of the setup menu.

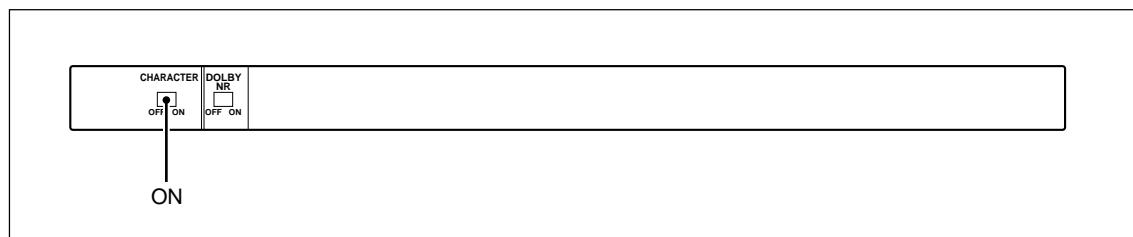


**S1100 of SS-63 Board**

- (2) Turn on the power, and set each control panel as shown below.



**Upper/Lower Control Panels**



**Sub Control Panel**

(3) Setting of the setup extend menu

- For DNW-A22

Set the SUB-ITEMs of ITEM-709 and ITEM-713 as shown below.

After adjustments are completed, return the SUB-ITEMs to their previous settings.

ITEM	SUB-ITEM	Setting	Previous setting (fill up)
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	B-CAM	
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	0.0%	
	3. BETACAM PB LEVEL	MSTER	
	4. OUTPUT LEVEL	MSTER	

- For DNW-A22P

None.

## For Maintenance Mode

Describes the operation of the maintenance mode as follows:

### Notes

The sub mode and menus of the maintenance mode that are used after replacing the TBC-23 board are as shown below.

#### • How to enter the maintenance mode

- (1) Push S1101 (G-1) on the SS-63 board.

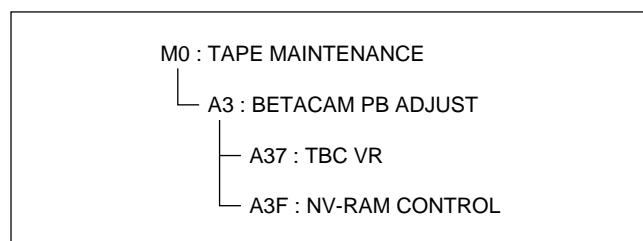
#### • How to enter the next menu (mode)

- (1) Push the JOG button once.

= Search dial enters into the JOG mode.

- (2) To set the cursor (\* mark) to the desired menu (mode), turn the search dial.

- (3) Push the SET button once.



#### • How to exit the current menu (mode)

- (1) Push the MENU button once.

### Note

If the MENU button is pushed several times, the maintenance mode exits.

#### • How to change the data value

- (1) To set the cursor (\* mark) to the item, turn the search dial.

- (2) Turn the search dial slowly while pressing the JOG button. = Data value changes.

REVERSE direction: decrease the data value (00's next is FF)

FORWARD direction: increase the data value (FF's next is 00)

### Note

During adjustment, change the rotational direction of the search dial according to the change of waveform that is displayed on the measuring equipment.

#### • How to save the data

- (1) To set the cursor (\* mark) to A3F : NV-RAM CONTROL, turn the search dial.

- (2) Push the SET button once.

- (3) To set the cursor (\* mark) to “SAVE ALL ADJUST DATA”, turn the search dial.

- (4) Push the SET button once.

## 1. Initial Data Setting

- (1) Enter the maintenance mode, then enter A37 : TBC VR.
- (2) Set the specified data to all items of A37 : TBC VR.

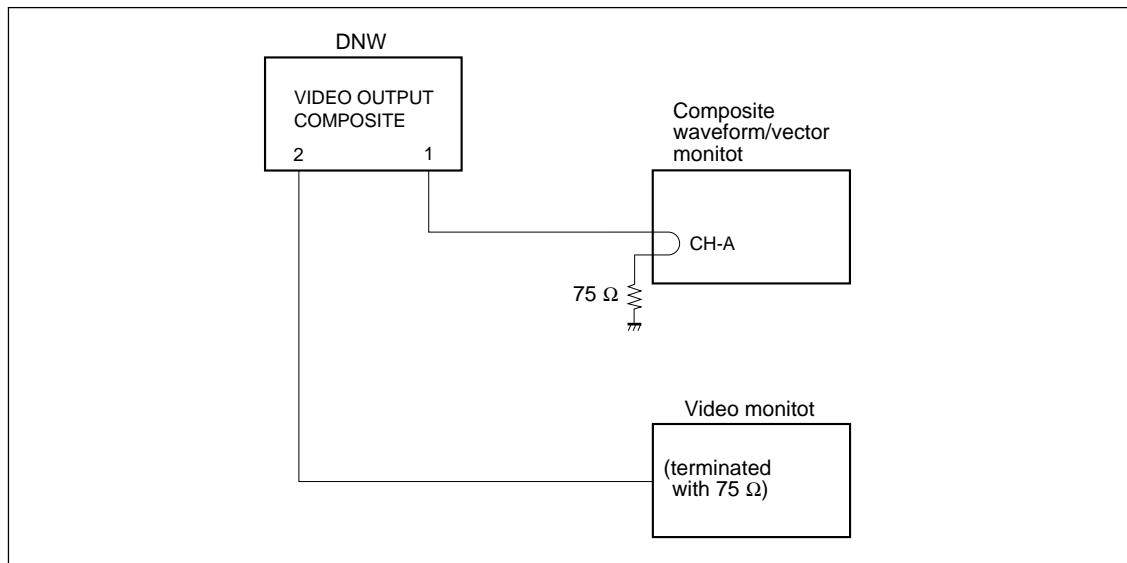
Item of A37 : TBC VR	Setting data for DNW-A22	Setting data for DNW-A22P
SQ Y RZ	4C	4B
SQ C RZ	6F	6E
VISC PHASE	06	02

- (3) To exit A37 : TBC VR, push the MENU button once.
- (4) Data save  
Enter A3F : NV-RAM CONTROL of the maintenance mode, then execute “SAVE ALL ADJUST DATA”.
- (5) Check that the message “Save Complete” is displayed on the video monitor.
- (6) To exit A3F : NV-RAM CONTROL, push the MENU button once.
- (7) To exit the maintenance mode, push the MENU button three times again.

## 2. PB Video Phase Confirmation

Measuring equipment: Refer to next figure.

- (1) Connect the waveform/vector monitor and video monitor as shown below.



Connection in PB Video Phase Confirmation

**Y phase confirmation [to step (15)]**

- (2) Set the composite waveform/vector monitor as follows:  
WAVEFORM mode, SWEEP: 2H, MAG ON, INPUT: CH-A, INT REF
- (3) Display the BURST signal part of CH-A side on the composite waveform/vector monitor.
- (4) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

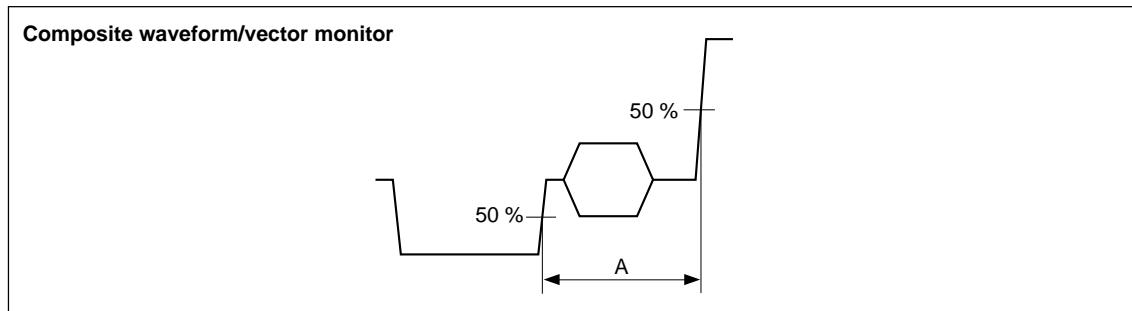
- (5) Confirm that time between the 50% position at rising edge of H SYNC signal and the 50% position at the rising edge of white signal portion.

If the specification is not satisfied, perform the adjustment.

Adjustment point:  $\bullet$ RV300/TBC-24(D-1)

Specification:  $A = 5.2 \pm 0.1 \mu\text{s}$

If the specification is not satisfied by adjustment, perform step (6) through (9) after setting RV300 to the mechanical center.



Perform following steps (6) through (9) only when the specification in step (5) is not satisfied.

- (6) Playback the burst signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS again.

- (7) Enter the maintenance mode, then enter A37 : TBC VR.

- (8) The BOWTIE dip point comes closer to the center marker so that the data value of item “SQ Y RZ” is within +1 or -1.

- (9) Perform step (5) again.

#### Data save [to step (14)]:

Perform the data save only when SQ Y RZ's data value of A37 : TBC VR is changed.

- (10) To exit A37 : TBC VR, push the MENU button on the lower control panel.

- (11) Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.

- (12) Check that the message “Save Complete” is displayed on the video monitor.

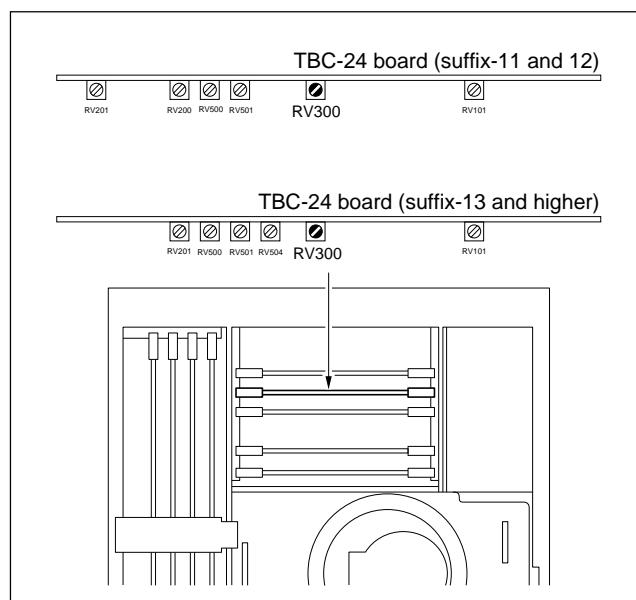
- (13) To exit A3F : NV-RAM CONTROL, push the MENU button once.

- (14) To exit the maintenance mode, push the MENU button three times again.

- (15) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

#### Note

It is not necessary to eject the alignment tape when perform subsequent “3. TBC Y/C Delay Confirmation”.

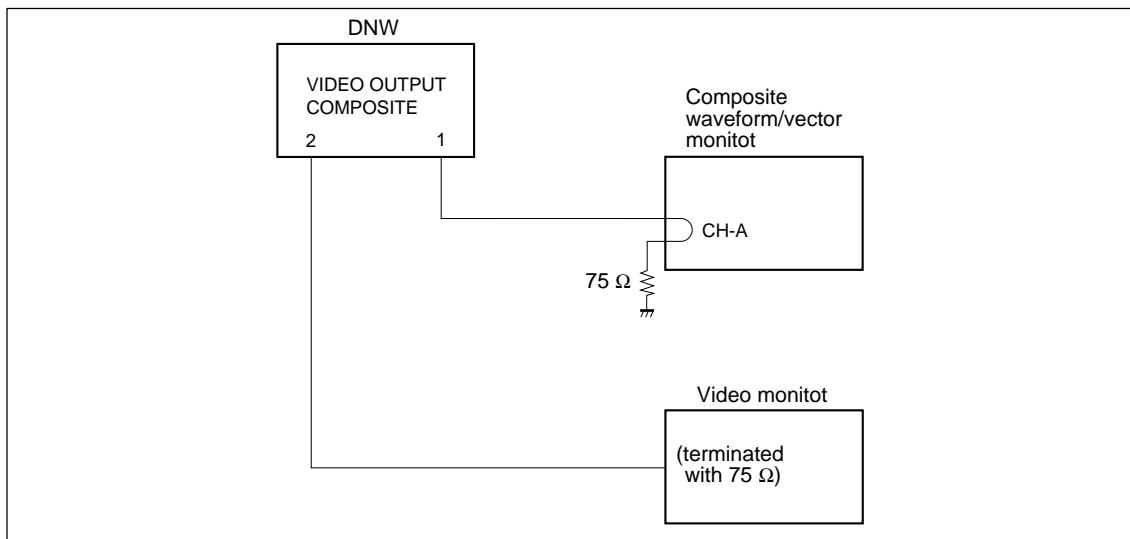


**RV300 on TBC-24 Board**

### 3. TBC Y/C Delay Confirmation

Measuring equipment: composite waveform/vector monitor.

- (1) Connect the composite waveform/vector monitor and video monitor as shown below.



**Connection in Y/C Delay Confirmation**

#### C phase confirmation [to step (5)]

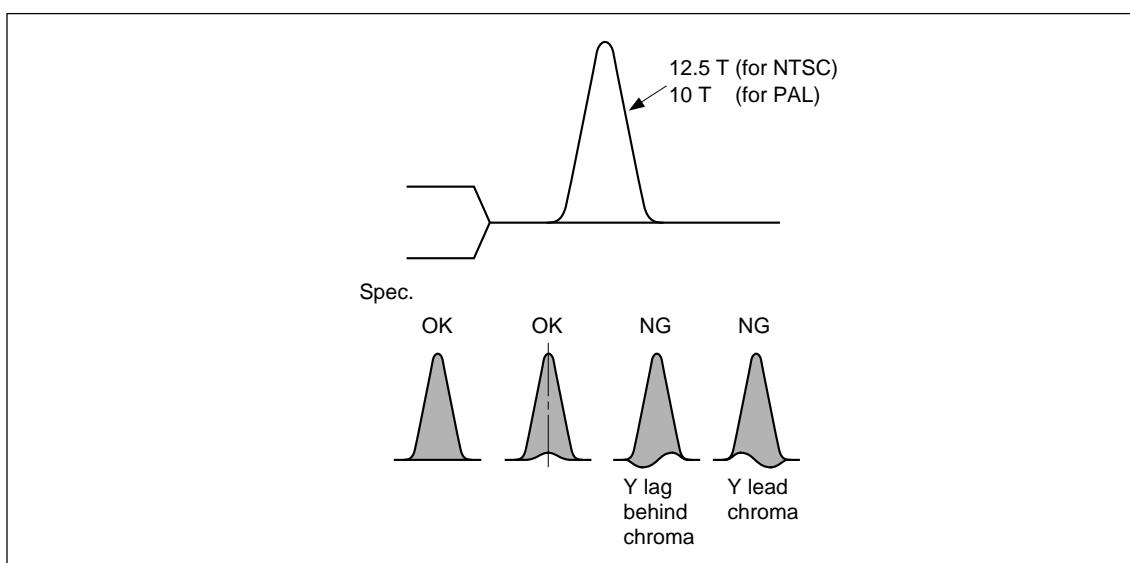
- (2) Set the composite waveform/vector monitor as follows:

WAVEFORM mode, SWEEP: 2H, MAG ON, INPUT: CH-A, INT REF  
LINE SELECT: 183 to 202 for NTSC/218 to 241 for PAL

- (3) Playback the bowtie signal portion (17:00 to 19:00) of the alignment tape CR5-1B or CR5-1B PS.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

- (4) Observe the 12.5T (PAL: 10T) portion of bowtie signal, confirm that the waveform satisfies the specification.

If the specification is not satisfied, perform steps (6) through (20).



- (5) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

**Note**

It is not necessary to eject the alignment tape when perform subsequent “4. VISC Phase Adjustment”.

Perform following steps (6) through (20) when the specification in step (4) is not satisfied.

### METAL adjustment [to step (17)]

(6) Playback the bowtie signal portion (17:00 to 19:00) of the alignment tape CR5-1B or CR5-1B PS.

(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

(7) Observe the 12.5T (PAL: 10T) portion of bowtie signal, adjust so that the waveform satisfies the specification.

Adjustment points: Field 1: **RV500/TBC-24(B-1)**

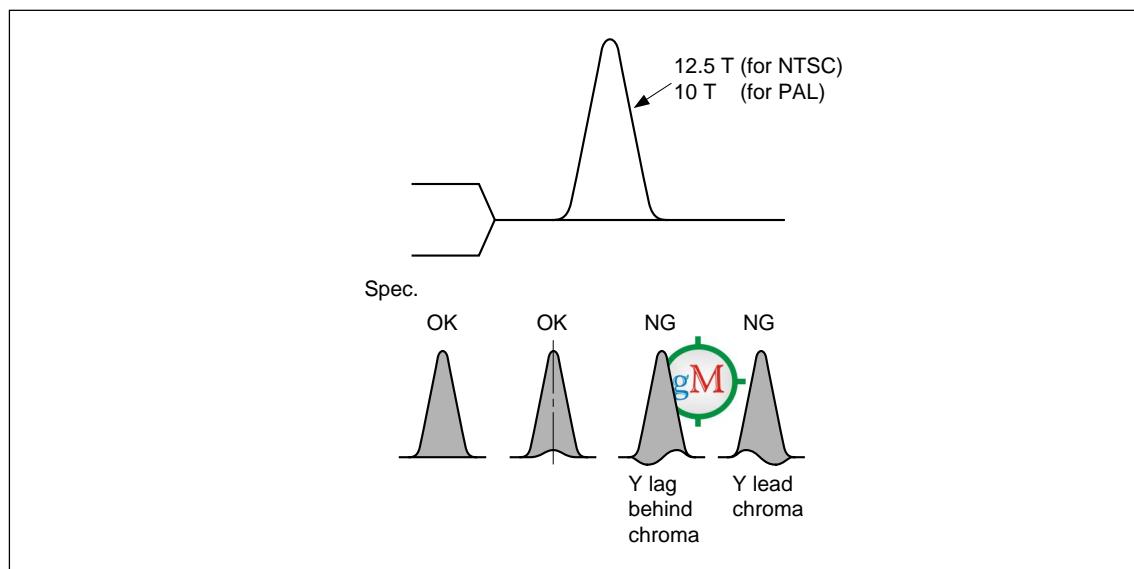
Field 2: **RV504/TBC-24(C-1)**

If the specification is not satisfied by adjusting RV500, perform steps (8) through (11) after setting RV500 to the mechanical center.

#### Note

RV504 is not equipped with the board number suffixes 11 and 12 of TBC-24 board.

Therefore, adjust RV500 only.



Perform following steps (8) through (11) when the specification in step (7) is not satisfied.

(8) Playback the bowtie signal portion (17:00 to 19:00) of the alignment tape CR5-1B or CR5-1B PS again.

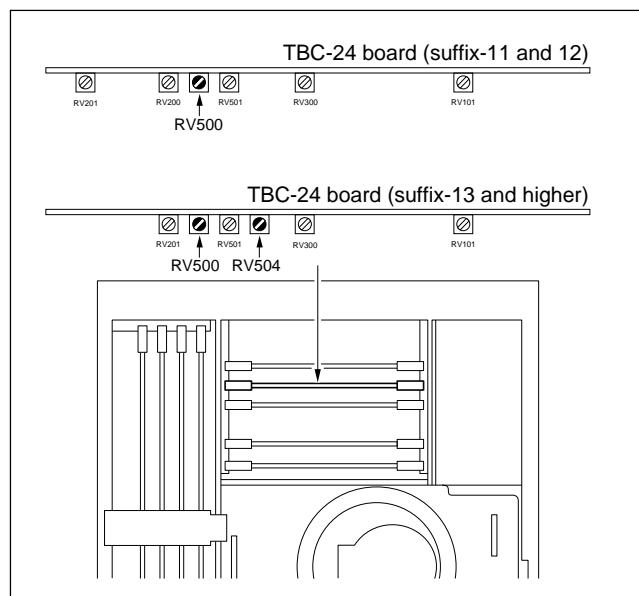
(9) Enter the maintenance mode, then enter A37 : TBC VR.  
(10) The data value of item "SQ C RZ" is within +2 or -2.

(11) Perform step (7) again.

### Data save [to step (16)]:

Perform the data save only when SQ C RZ's data value of A37 : TBC VR is changed.

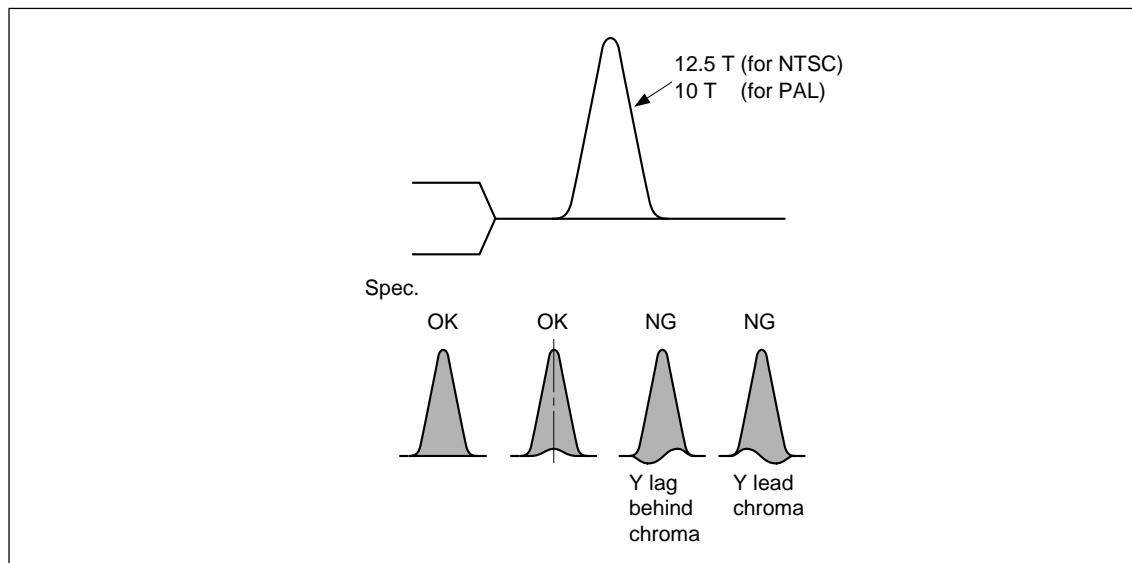
- (12) To exit A37 : TBC VR, push the MENU button on the lower control panel.
- (13) Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".
- (14) Check that the message "Save Complete" is displayed on the video monitor.
- (15) To exit A3F : NV-RAM CONTROL, push the MENU button once.
- (16) To exit the maintenance mode, push the MENU button three times again.
- (17) Eject the alignment tape CR5-1B/CR5-1B PS.



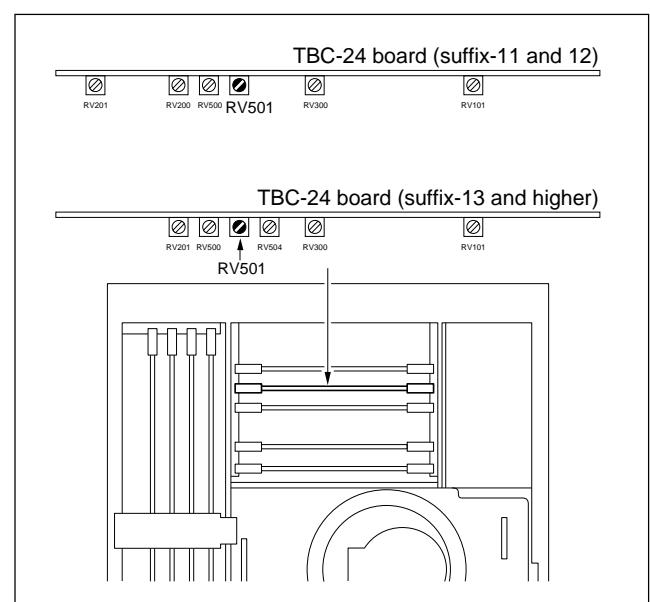
**RV500 and RV504 on TBC-24 Board**

**OXIDE adjustment [to step (20)]**

- (18) Playback the bowtie signal portion (6:00 to 9:00) of the alignment tape CR5-2A or CR5-2A PS.  
 (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)
- (19) Observe the 12.5T (PAL: 10T) portion of bowtie signal, adjust so that the waveform satisfies the specification.
- Adjustment point: **RV501/TBC-24(C-1)**



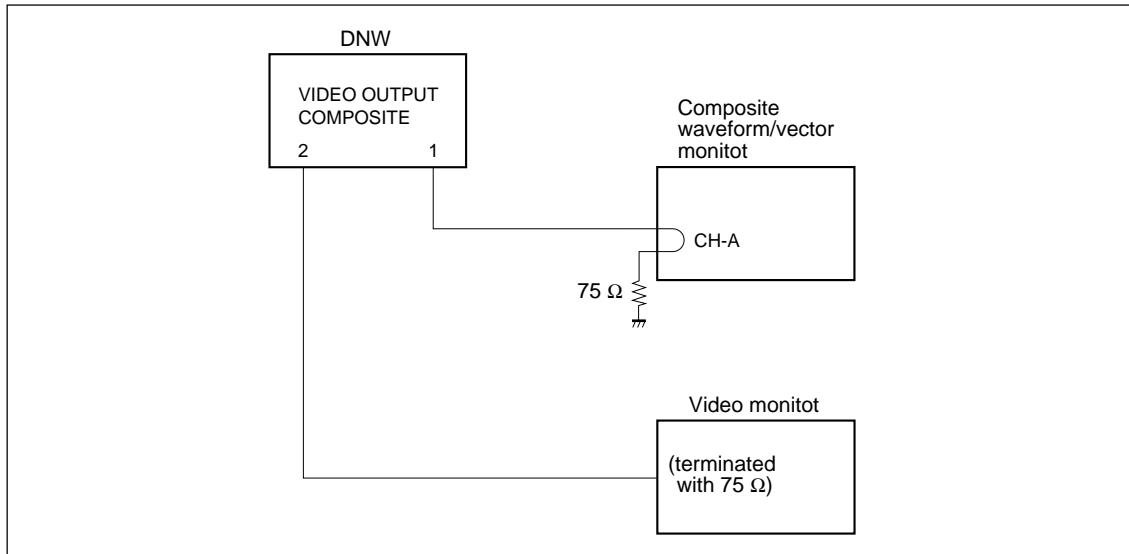
- (20) Eject the alignment tape CR5-2A/CR5-2A PS.

**RV501 on TBC-24 Board**

#### 4. VISC Phase Adjustment

Measuring equipment: Composite waveform/vector monitor

- (1) Connect the composite waveform/vector monitor and video monitor as shown below.



**Connection in VISC Phase Adjustment**

- (2) Set the composite waveform/vector monitor as follows:

WAVEFORM mode, INPUT: CH-A, INT REF, SWEEP: 1 FLD

- (3) Playback the H sweep signal portion (28:00 to 30:00) of the alignment tape CR5-1B or CR5-1B PS.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

**Note**

Continue playing back the alignment tape from here till step (16).

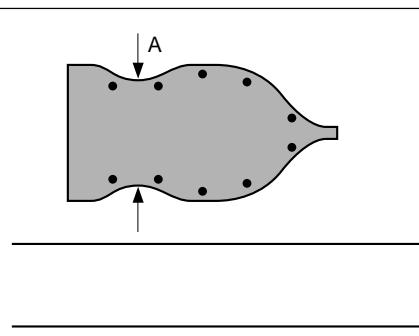
Be sure to perform working of steps (6) through (15) continuously without interval.

- (4) Set the CAPSTAN LOCK switch on the sub control panel as follows, then return it to the 2FD after two seconds.

DNW-A22: 4FD

DNW-A22P: 8FD

- (5) Repeat sequences in STOP and PLAY BACK until the hollow of A portion is maximized.



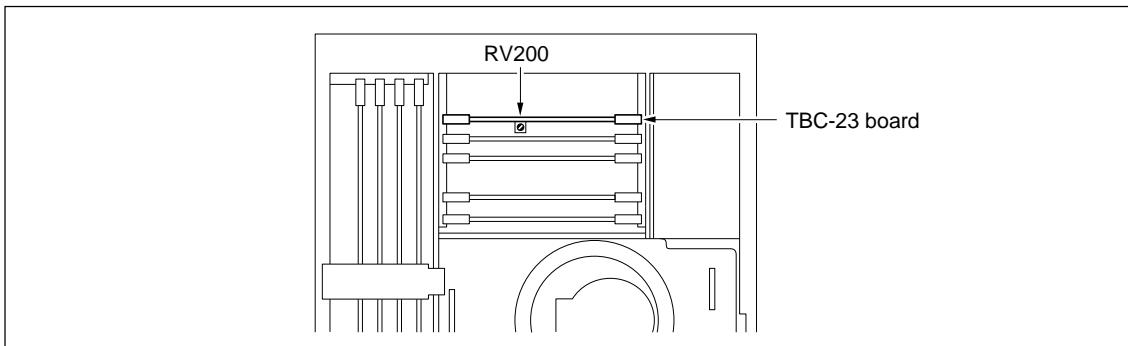
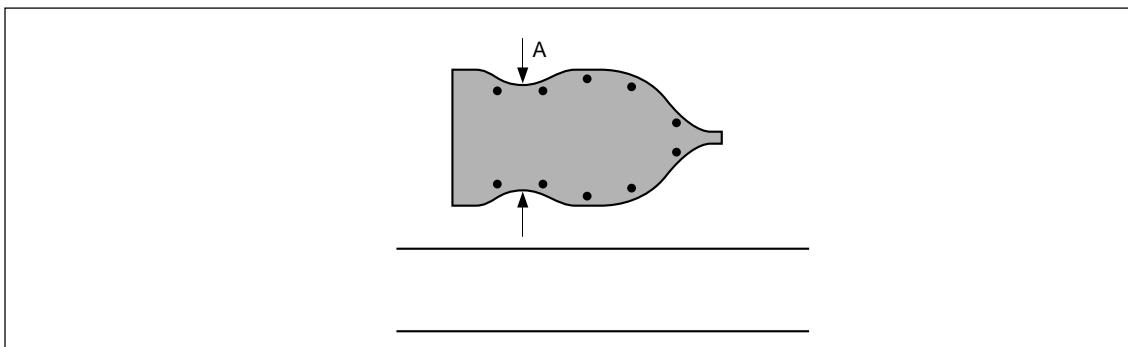
(6) Set the CAPSTAN LOCK switch on the sub control panel as follows:

DNW-A22: 4FD

DNW-A22P: 8FD

(7) Adjust the hollow of A portion to minimum.

Adjustment point: **●**RV200/TBC-23(C-1)



## 6-7. TBC-24 Board Replacement

The electrical adjustments are essential after the TBC-24 board is replaced.

To perform the electrical adjustment, the following equipment and fixtures are required.

**Note**

Some adjustments are different according to the board number suffix (XX of 1-648-542-XX) of TBC-24 board.

Be sure to confirm the suffix of board number before replacement. The board number is indicated on the left margin (A-6) of A side of TBC-24 board.

- Composite waveform/vector monitor

For DNW-A22: TEKTRONIX 1780R or equivalent (With LINE SELECT)

For DNW-A22P: TEKTRONIX 1781R or equivalent (With LINE SELECT)

- Composite video monitor

- Extension board: EX-377 (SONY parts No. J-6269-810-A)

- 75 Ω terminators (1 piece)

- Cleaning tape: BCT-5CLN (SONY standard products)

- Alignment tapes

For DNW-A22: CR5-1B (SONY parts No. 8-960-096-41) and

CR5-2A (SONY parts No. 8-960-097-44)

For DNW-A22P: CR5-1B PS (SONY parts No. 8-960-096-91) and

CR5-2A PS (SONY parts No. 8-960-098-44)

### 6-7-1. Replacement Procedure

**Note**

Turn off the POWER switch before starting the replacement.

- (1) Remove the upper lid, board retainer (S), and TBC-24 (original) board.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”.)
- (2) Disconnect the one disconnected harness (that it connected TBC-24 board and TBC-23 board) from TBC-23 board.
- (3) After inserting the extension board EX-377 to the slot for TBC-24 board, and then connect a new TBC-24 board to the extension board.
- (4) Connect the extension harness to CN1 on TBC-24 (new) board and CN1 on TBC-23 board.
- (5) Clean the video heads by cleaning tape.  
(Refer to “5-2-1. Cleaning by Cleaning Tape”.)
- (6) Perform the electrical adjustments (Section 6-7-2).

**Note**

Remove the extension board and extension harness in some steps of the electrical adjustment.

- (7) For DNW-A22 only  
Return the ITEM-709 and ITEM-713 of setup extend menu to previous settings after the electrical adjustments are completed.
- (8) Return the states of S1100-1 on the SS-63 board and control panels to their previous states.
- (9) Turn off the power.
- (10) Install the board retainer (S) and upper lid.  
(Refer to “6-1-3. Plug-in Board Pulling out/Insertion”.)

## 6-7-2. Electrical Adjustments

### Adjustment Items

No.	Item	Adjustment point	Notes
0	Preparation		
1	Composite output level adjustment	METAL Y <b>•RV101/TBC-24</b> METAL C <b>•RV201/TBC-24</b> OXIDE Y <b>•RV504/DM-89</b> OXIDE C <b>•RV704/DM-89 (DNW-A22P only)</b>	VIDEO OUTPUT COMPOSITE 1
2	A/D clamp DC level adjustment (Note 1)	C <b>•RV202/TBC-24</b> Y <b>•RV102/TBC-24</b>	TP202/TBC-24 TP102/TBC-24
3	VCO lock-in range adjustment	Y <b>•RV404/TBC-24 (Note 2)</b> <b>•LV401/TBC-24</b> C <b>•RV604/TBC-24 (Note 2)</b> <b>•LV601/TBC-24</b>	RV404/TBC-24 TP403/TBC-24 RV604/TBC-24 TP603/TBC-24
4	FAST VCO tracking adjustment	Gain <b>•RV400/TBC-24 (Note 3)</b> Offset <b>•RV402/TBC-24 (Note 4)</b>	RV400/TBC-24 Video monitor
5	PB video phase adjustment	<b>•RV300/TBC-24</b>	VIDEO OUTPUT COMPOSITE 1
		A37: TBC VR: SQ Y RZ (Note 5)	
6	TBC Y/C delay rough adjustment	METAL <b>•RV502/TBC-24</b> <b>•RV503/TBC-24</b> <b>•RV500/TBC-24</b> A37: TBC VR: SQ Y RZ (Note 6) <b>•RV504/TBC-24 (Note 7)</b>	VIDEO OUTPUT COMPOSITE 1
7	Impact error offset adjustment	Y <b>•RV401/TBC-24</b> C <b>•RV601/TBC-24</b>	Video monitor
8	TBC Y/C delay adjustment	METAL <b>•RV500/TBC-24</b> <b>•RV504/TBC-24 (Note 7)</b> OXIDE <b>•RV501/TBC-24</b>	VIDEO OUTPUT COMPOSITE 1 VIDEO OUTPUT COMPOSITE 1

Note 1: Their RV102 and RV202 are equipped with the board number suffixes 11 and 12 of TBC-24 board. Therefore, the electrical adjustments are essential to them.

Note 2: Their RV404 and RV604 are equipped with the board number suffixes 11 and 12 of TBC-24 board.

Note 3: This RV400 is equipped with the board number suffixes 11, 12, and 13 of TBC-24 board.

Note 4: This RV402 is not equipped with the board number suffixes 14 and higher of TBC-24 board for DNW-A22P.

Note 5: If the specification is not satisfied by RV300, change the data of A37: TBC VR: SQ Y RZ.

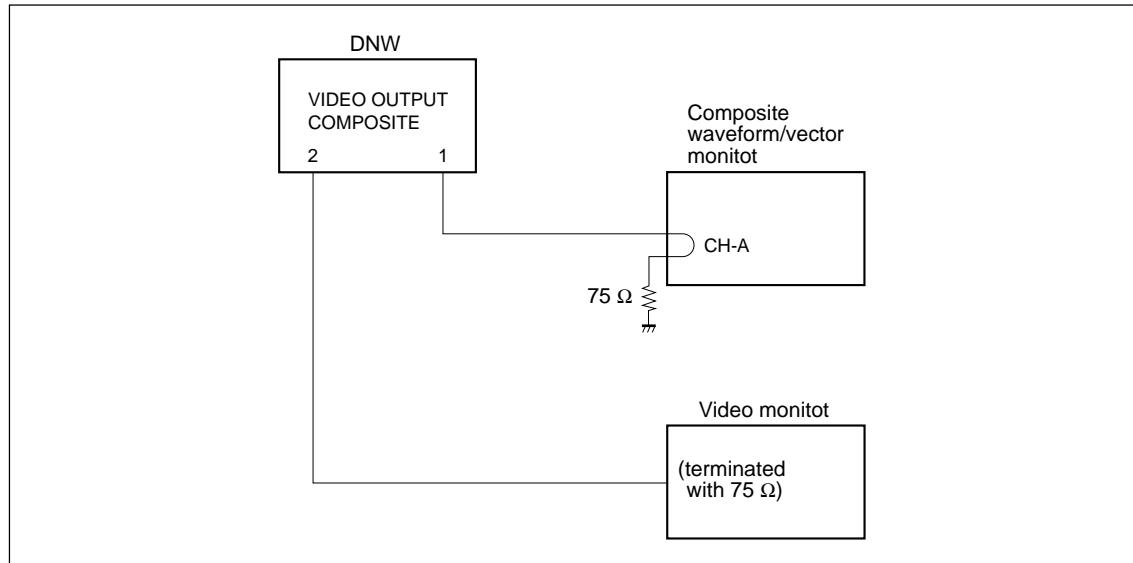
Note 6: If the specification is not satisfied by RV500, change the data of A37: TBC VR: SQ C RZ.

Note 7: This RV504 is equipped with the board number suffixes 13 and higher of TBC-24 board.

## 0. Preparation

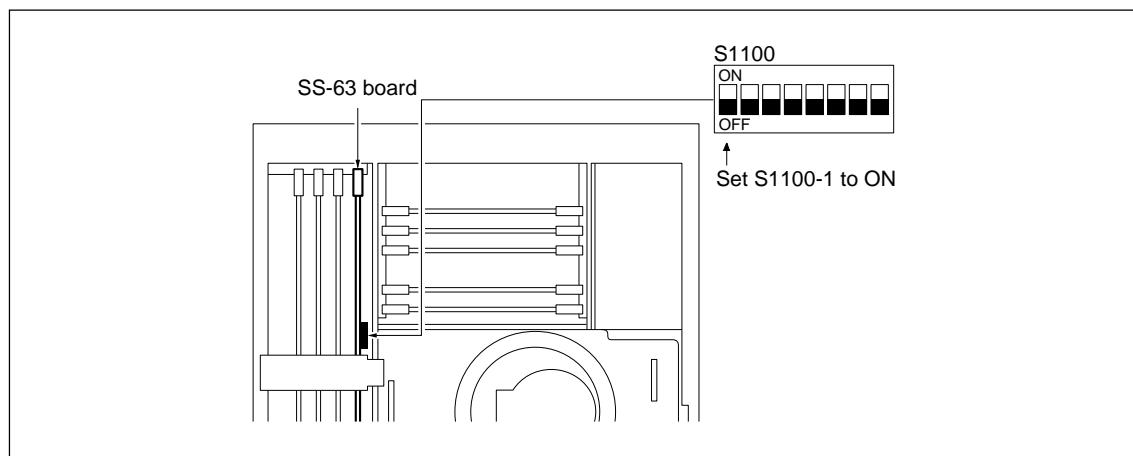
### Connection

Connect the composite waveform/vector monitor and video monitor as shown below.



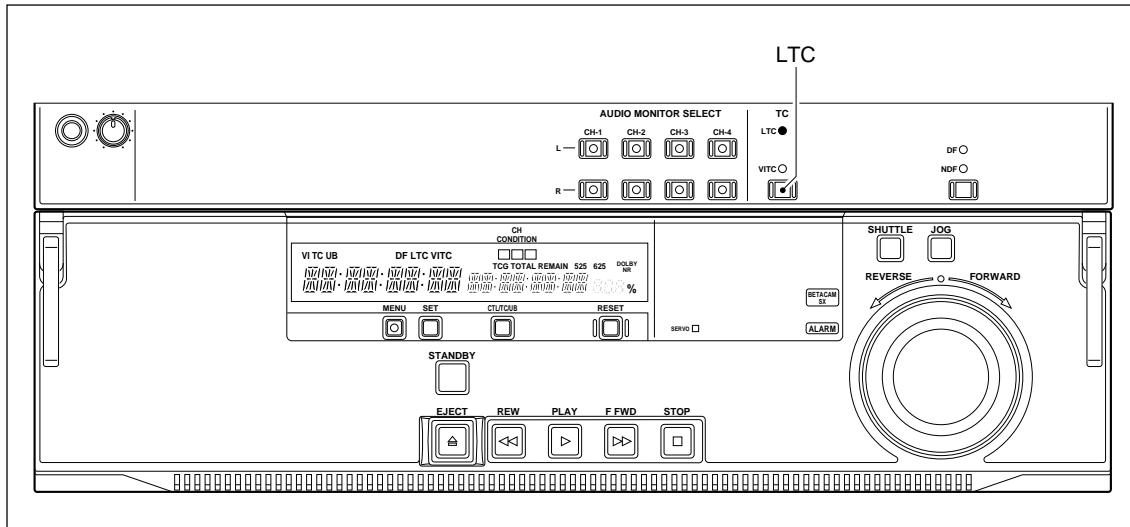
### Setting of DNW

- (1) Set S1100-1 on SS-63 board to ON to treat the extended menu of the setup menu.

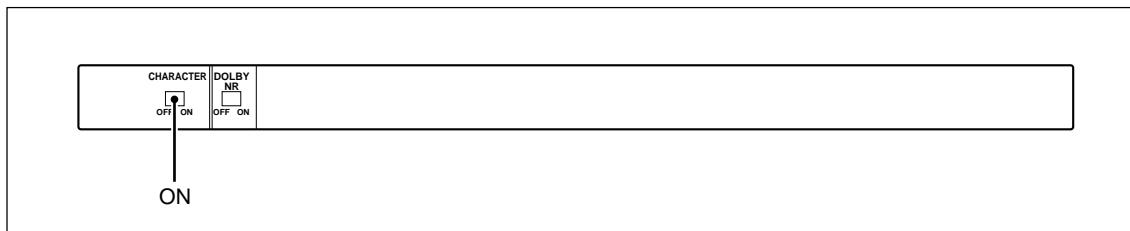


**S1100 of SS-63 Board**

(2) Turn on the power, and set each control panel as shown below.



**Upper/Lower Control Panels**



**Sub Control Panel**

(3) Setting of the setup extend menu

- For DNW-A22

Set the SUB-ITEMs of ITEM-709 and ITEM-713 as shown below.

After adjustments are completed, return the SUB-ITEMs to their previous settings.

ITEM	SUB-ITEM	Setting	Previous setting (fill up)
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	B-CAM	
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	0.0%	
	3. BETACAM PB LEVEL	MSTER	
	4. OUTPUT LEVEL	MSTER	

- For DNW-A22P

None.

## For Maintenance Mode

Describes the operation of the maintenance mode as follows:

### Notes

The sub mode and menus of the maintenance mode that are used after replacing the TBC-23 board are as shown below.

#### • How to enter the maintenance mode

- (1) Push S1101 (G-1) on the SS-63 board.

#### • How to enter the next menu (mode)

- (1) Push the JOG button once.  
= **Search dial enters into the JOG mode.**
- (2) To set the cursor (\* mark) to the desired menu (mode), turn the search dial.
- (3) Push the SET button once.

#### • How to exit the current menu (mode)

- (1) Push the MENU button once.

### Note

If the MENU button is pushed several times, the maintenance mode exits.

#### • How to change the data value

- (1) To set the cursor (\* mark) to the item, turn the search dial.
- (2) Turn the search dial slowly while pressing the JOG button. = **Data value changes.**

REVERSE direction: decrease the data value (00's next is FF)

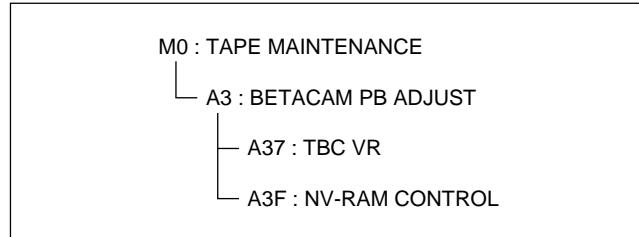
FORWARD direction: increase the data value (FF's next is 00)

### Note

During adjustment, change the rotational direction of the search dial according to the change of waveform that is displayed on the measuring equipment.

#### • How to save the data

- (1) To set the cursor (\* mark) to A3F : NV-RAM CONTROL, turn the search dial.
- (2) Push the SET button once.
- (3) To set the cursor (\* mark) to “SAVE ALL ADJUST DATA”, turn the search dial.
- (4) Push the SET button once.



## 1. Composite Output Level Adjustment

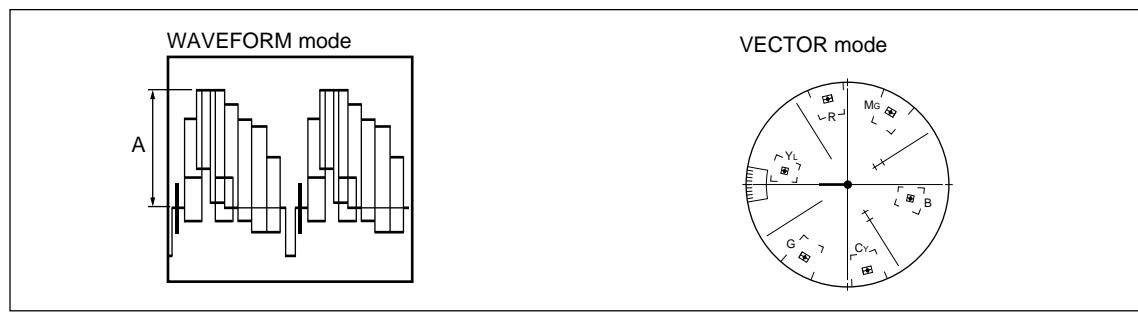
Measuring equipment: Composite waveform/vector monitor (terminated with  $75\ \Omega$ )

### (1) METAL level adjustment

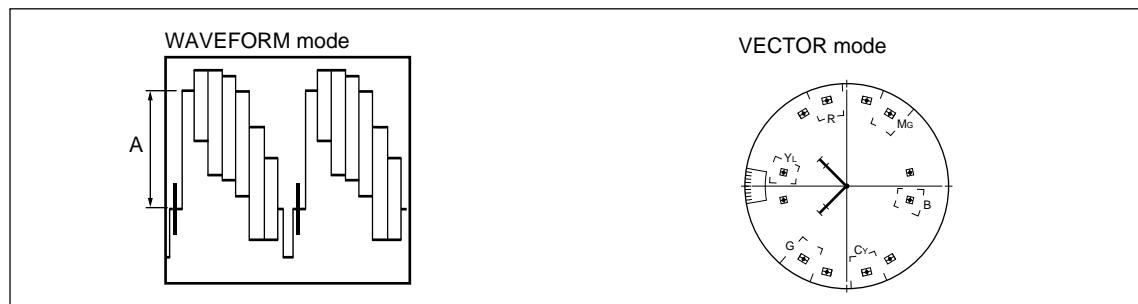
Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and perform the adjustment of each composite signal level.

(DNW-A22 CR5-1B, DNW-A22P: CR5-1B PS)

Equipment setting	Specifications	Adjustment point
WAVEFORM mode	DNW-A22: $A = 714 \pm 7\text{ mV}$ ( $A = 100 \pm 1\text{ IRE}$ ) DNW-A22P: $A = 700 \pm 7\text{ mV}$	RV101/TBC-24(F-1)
VECTOR mode	Inside the corresponding frames (DP: $\pm 2.5^\circ$ , DG: $\pm 2.5\%$ )	RV201/TBC-24(A/B-1)

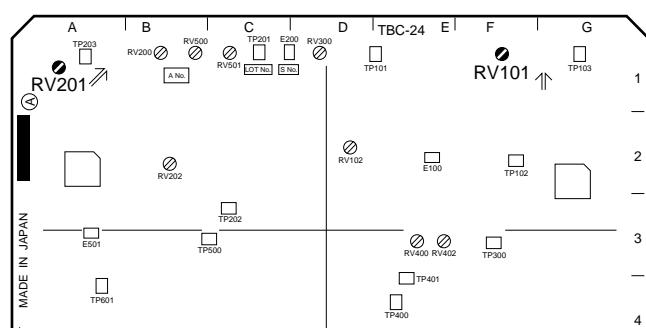


DNW-A22

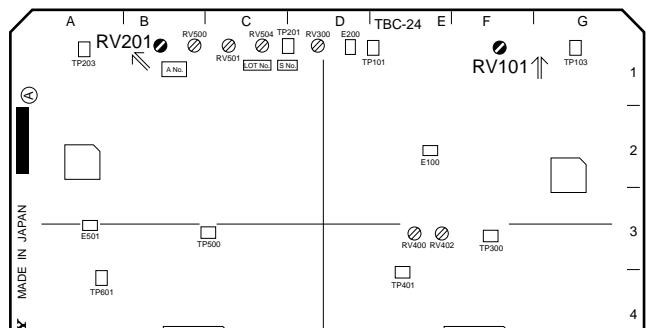


DNW-A22P

### (2) Eject the alignment tape CR5-1B/CR5-1B PS.



TBC-24 Board (A Side) (Suffix-11 and -12)



TBC-24 Board (A Side) (Suffix-13 and higher)

## (3) OXIDE level confirmation

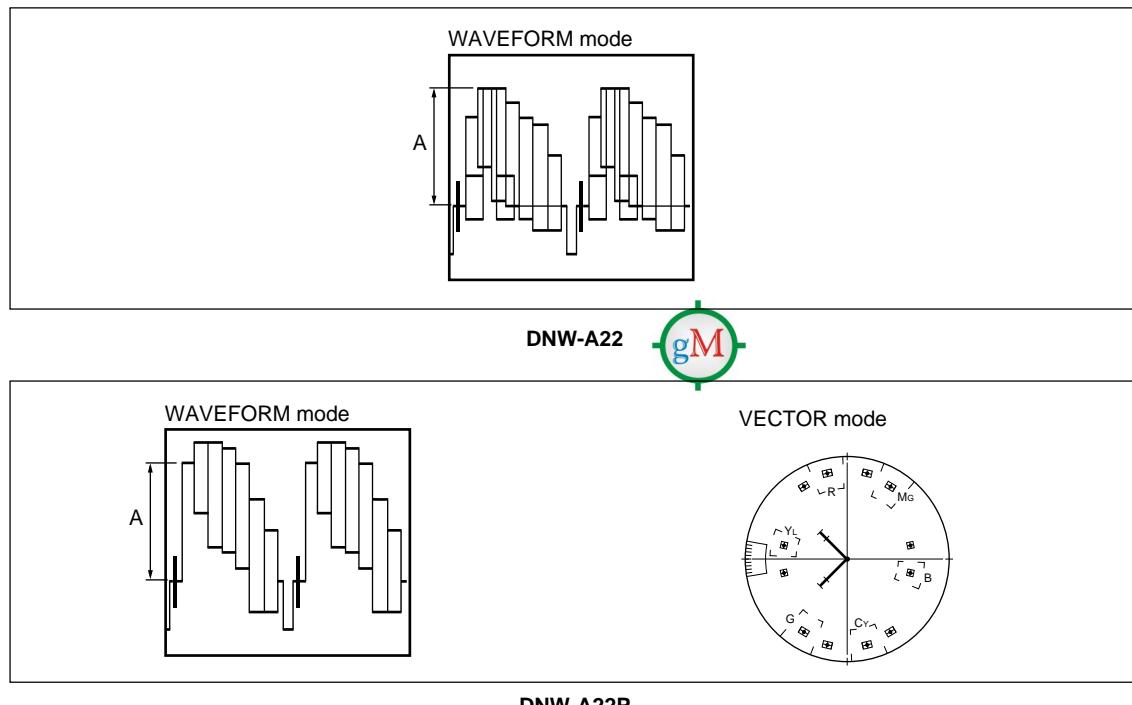
Playback the 75% color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS, and perform the check of each composite signal level. If the specification is not satisfied, perform the adjustment of the composite output level.

(DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)

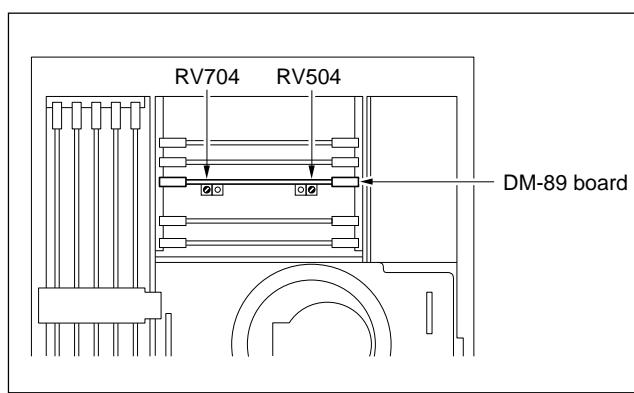
**Note**

For DNW-A22, perform the check (adjustment) for Y signal only.

Equipment setting	Specifications	Adjustment point
WAVEFORM mode	DNW-A22: A = $714 \pm 7$ mV (A = $100 \pm 1$ IRE) DNW-A22P: A = $700 \pm 7$ mV	•RV504/DM-89(F-1)
VECTOR mode	Inside the corresponding frames (DP: $\pm 2.5^\circ$ , DG: $\pm 2.5\%$ )	•RV704/DM-89(B-1) DNW-A22P only



## (4) Eject the alignment tape CR5-2A/CR5-2A PS.



RV504 and RV704 on DM-89 Board

**Note**

RV504 and RV704 on DM-89 board are possible to adjust without using the extension board.

## **2. A/D Clamp DC Level Adjustment**

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## Note

“A/D Clamp DC Level Adjustment” is needed for TBC-24 board of the board numbers 1-648-542-11 and 1-648-542-12.

## Measuring equipment: Oscilloscope

- (1) When the alignment tape is inserted to DNW, eject it.  
(2) Connect and set the oscilloscope as follows:  
CH-1: TP202/TBC-24(C-3), 500 mV/DIV, 10  $\mu$ s/DIV, GND: E200/TBC-24(C-1)  
CH-2: TP102/TBC-24(E-2), 500 mV/DIV, 10  $\mu$ s/DIV, GND: E100/TBC-24(E-2)

CH-2: TPI02/TBC-24(F-2), 500 mV/DIV, GND:

- (3) Turn off the power of DNW,

DC level measurement for C<sub>1</sub> and C<sub>2</sub> in CH-1 (TPCSC) is performed by the

- (5) Measure the DC level on the

Measure the DC level on the oscilloscope's CH-2 (TP102) after change the display mode of the oscilloscope to CH-2.

Measurement point	Measuring value (fill up)	Note
CH-1: TP202/TBC-24(C-3)		C
CH-2: TP102/TBC-24(F-2)		Y

- ## (6) Adjustments

Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, and adjust the DC voltage level of the following measurement points as identical to measured voltage in steps (4) and (5). (DNW-A22; CR5-1B, DNW-A22P; CR5-1B PS)

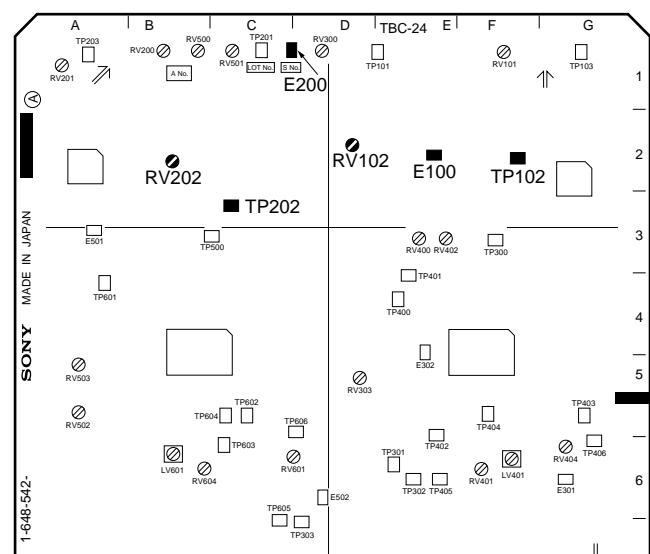
Measurement point	Adjustment point	Note
CH-1: TP202/TBC-24(C-3)	●RV202/TBC-24(B-2)	C
CH-2: TP102/TBC-24(F-2)	●RV102/TBC-24(D-2)	Y

- (7) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

---

**Note**

It is not necessary to eject the alignment tape when perform subsequent “3. VCO Lock-in Range Adjustment”.



TBC-24 Board (A Side) (Suffix-11 and -12)

### **3. VCO Lock-in Range Adjustment**

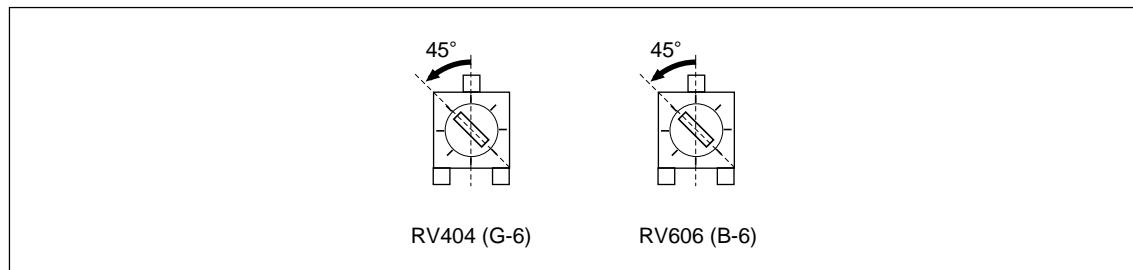
Measuring equipment: Oscilloscope

- (1) Set the following RVs on TBC-24 board to each specified position as shown below.

---

**Note**

Perform step (1) only when the board number suffix is 11 or 12.



- (2) Connect and set the oscilloscope as follows:

CH-1: TP403/TBC-24(G-5), DC 1 V/DIV, GND: E301/TBC24 (G-6)

CH-2: TP603/TBC-24(C-6), DC 1 V/DIV, GND: E502/TBC24 (D-6)

- (3) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS, then adjust each DC level of Y side and C side.

(DNW-A22; CR5-1B, DNW-A22P; CR5-1B PS)

Adjustment points: Y(CH-1) side: 0LV401/TBC-24(F-6)

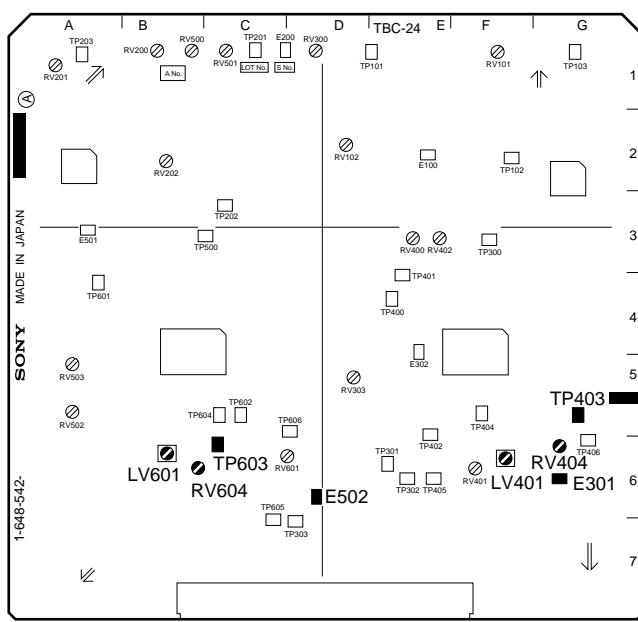
C(CH-2) side: OLV601/TBC-24(B-6)

Specifications (Y and C):  $2.0 \pm 0.2$  V dc

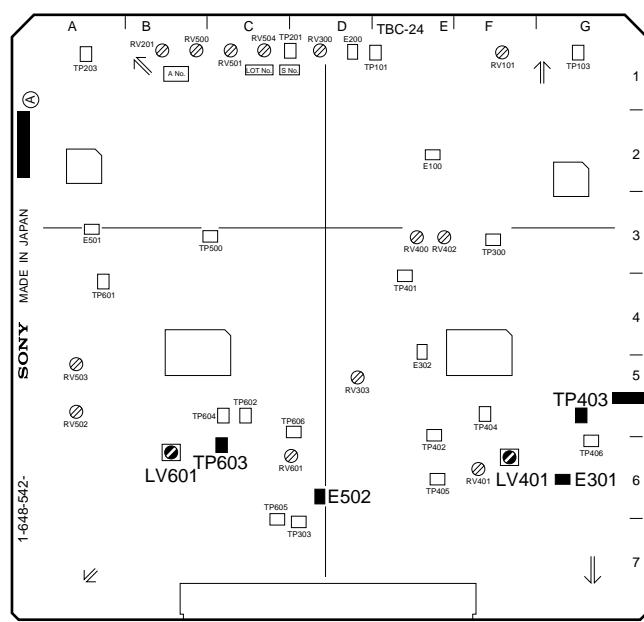
- (4) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

Note

It is not necessary to eject the alignment tape when perform subsequent “4. FAST VCO Tracking Adjustment”.



TBC-24 Board (A Side) (Suffix-11 and -12)



TBC-24 Board (A Side) (Suffix-13 and higher)

#### 4. FAST VCO Tracking Adjustment

Measuring equipment: Video monitor

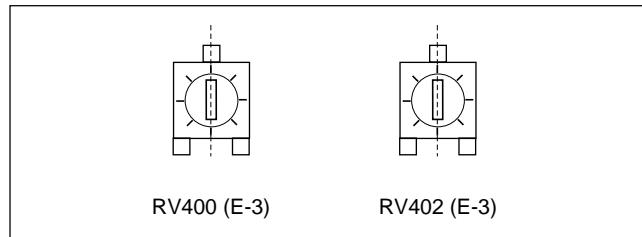
- (1) Set the following RVs on TBC-24 board to each specified position as shown below.

**Note**

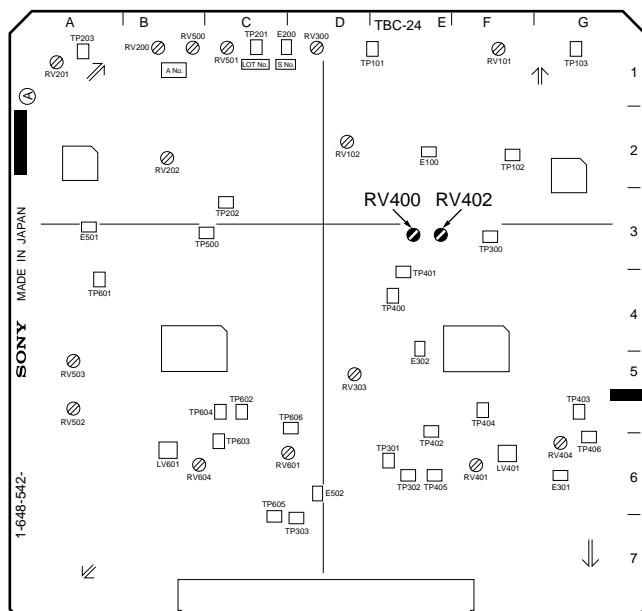
Specified RV(s) are not equipped according to the mode and the board number suffix of TBC-24 board.

Suffix	RV400	RV402
11, 12, 13	○	○
14 and higher	×	○: DNW-A22 X: DNW-A22P

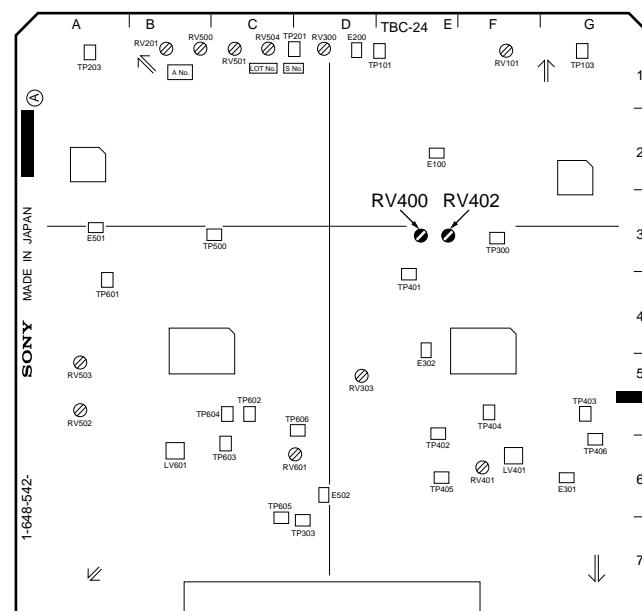
○: With RV    ×: Without RV



- (2) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS in the REW and FF mode, and confirm that the picture (color-bar) displays on the video monitor.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)
- (3) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B/CR5-1B PS in the SHUTTLE –24 times speed, then confirm that vertical lines of color-bar on the video monitor displays straight.  
In DNW-A22 only, if vertical lines are not straight, adjust RV402.
- (4) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B/CR5-1B PS in the range from VARIABLE –10 times speed to fastest + speed, then confirm that vertical lines of color-bar on the video monitor displays straight.  
In DNW-A22 only, if vertical lines are not straight, adjust RV402.
- (5) Eject the playback of the alignment tape CR5-1B/CR5-1B PS.
- (6) Playback the color-bar signal portion (0:00 to 3:00) of the alignment tape CR5-2A or CR5-2A PS in the REW and FF mode, and confirm that the picture (color-bar) displays on the video monitor.  
(DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)
- (7) Eject the alignment tape CR5-2A/CR5-2A PS.



TBC-24 Board (A Side) (Suffix-11 and -12)



TBC-24 Board (A Side) (Suffix-13 and higher)

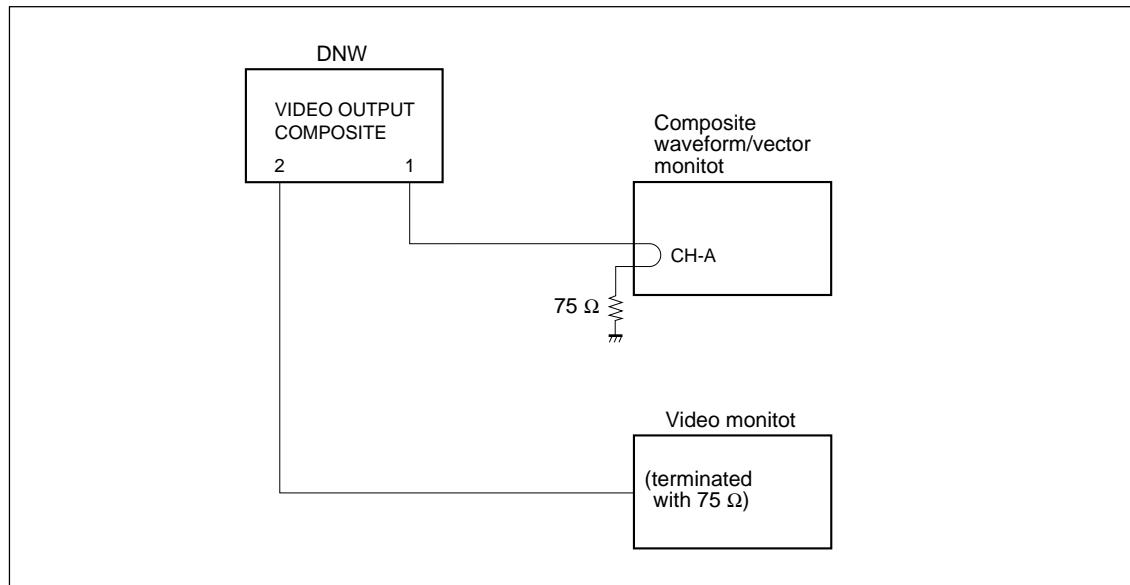
## 5. PB Video Phase Adjustment

**Note**

Perform this adjustment without using the extension board.

Measuring equipment: Refer to next figure.

- (1) Turn off the power of DNW.
- (2) Remove the TBC-24 board from the extension board, then pull out the extension board.
- (3) Install the TBC-24 board to DNW.
- (4) Turn on the power.
- (5) Connect the composite waveform/vector monitor and video monitor as shown below.



Connection in PB Video Phase Adjustment

**Y phase confirmation [to step (19)]**

- (6) Set the composite waveform/vector monitor as follows:

WAVEFORM mode, SWEEP: 2H, MAG ON, INPUT: CH-A, INT REF

LINE SELECT: 183 to 202 for NTSC

218 to 241 for PAL

- (7) Display the BURST signal part of CH-A side on the composite waveform/vector monitor.

- (8) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS.

(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)

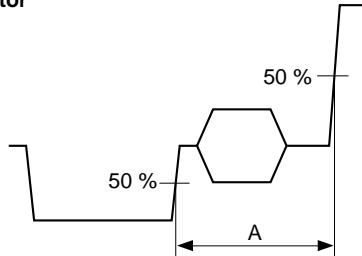
- (9) Confirm that time between the 50% position at rising edge of H SYNC signal and the 50% position at the rising edge of white signal portion.

Adjustment point:  RV300/TBC-24(D-1)

Specifications: A =  $5.2 \pm 0.1 \mu\text{s}$

If the specification is not satisfied by adjustment, perform steps (10) through (13) after setting RV300 to the mechanical center.

**Composite waveform/vector monitor**



Perform following steps (10) through (13) only when the specification in step (9) is not satisfied.

- (10) Playback the color-bar signal portion (14:00 to 17:00) of the alignment tape CR5-1B or CR5-1B PS again.

- (11) Enter the maintenance mode, then enter A37 : TBC VR.

- (12) The BOWTIE dip point comes closer to the center marker so that the data value of item "SQ Y RZ" is within +1 or -1.

- (13) Perform step (9) again.

**Data save [to step (27)]:**

Perform the data save only when SQ Y RZ's data value of A37 : TBC VR is changed.

- (14) To exit A37 : TBC VR, push the MENU button on the lower control panel.

- (15) Enter A3F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".

- (16) Check that the message "Save Complete" is displayed on the video monitor.

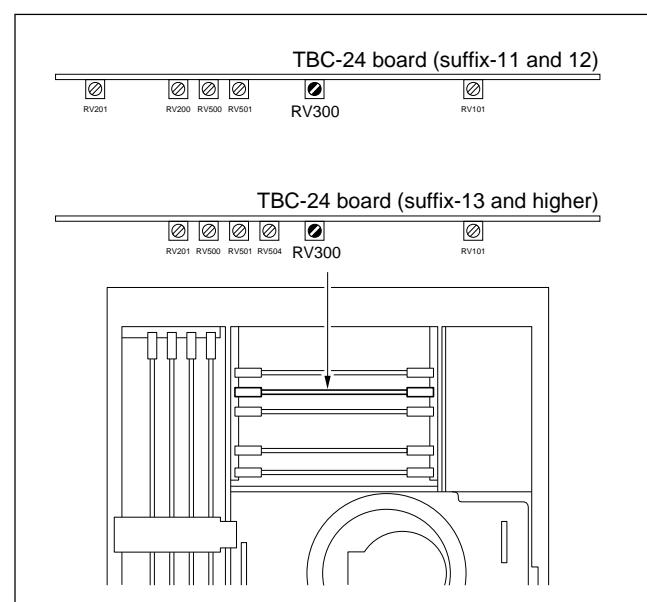
- (17) To exit A3F : NV-RAM CONTROL, push the MENU button once.

- (18) To exit the maintenance mode, push the MENU button three times again.

- (19) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

**Note**

It is not necessary to eject the alignment tape when perform subsequent "6. TBC Y/C Delay Rough Adjustment".



RV300 on TBC-24 Board

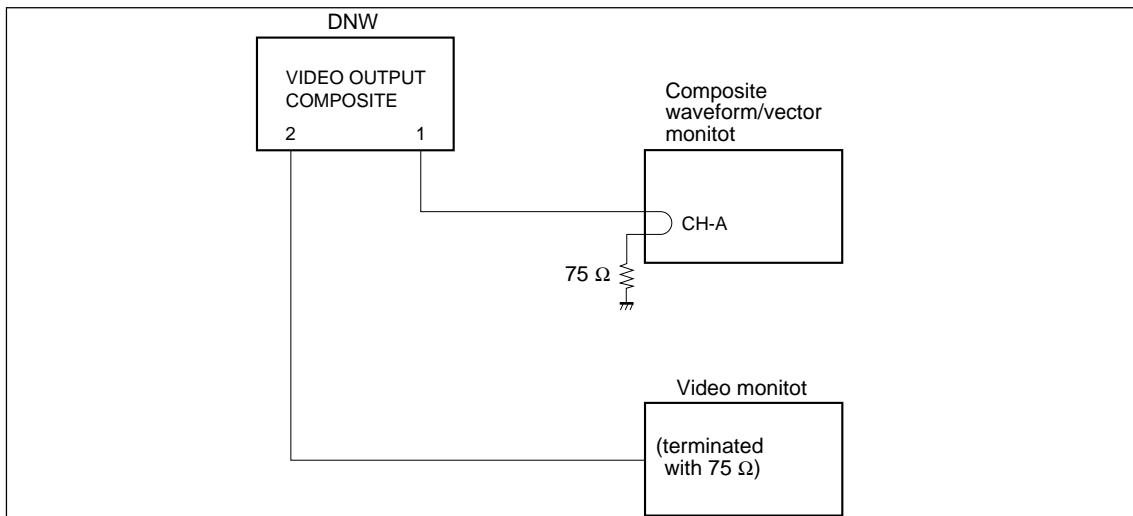
## 6. TBC Y/C Delay Rough Adjustment

Measuring equipment: Composite waveform/vector monitor

- (1) Turn off the power of DNW.
- (2) Extend the TBC-24 board with the extension board.
- (3) Turn on the power.
- (4) Connect the composite/waveform/vector monitor and video monitor as shown below.

**Note**

Do not change the connection until “8. TBC Y/C Delay Adjustment” is finished.



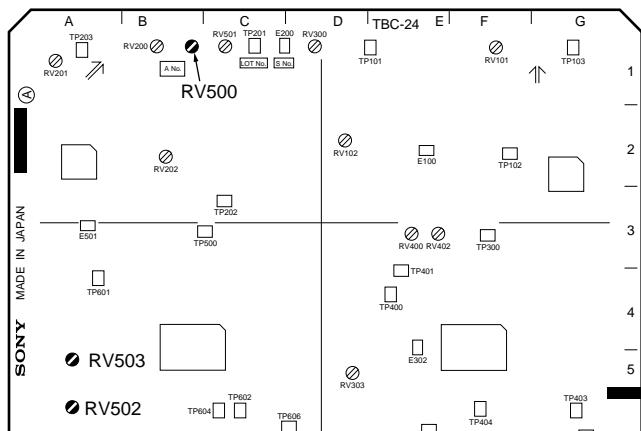
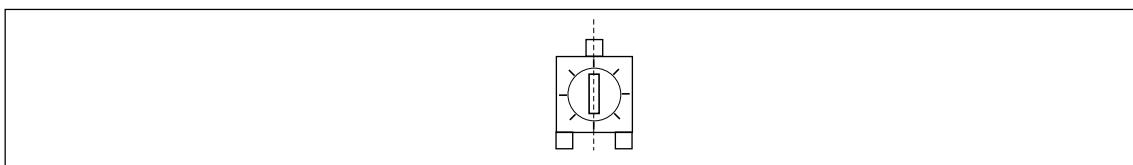
Connection in Y/C Delay Adjustment

- (5) Set the composite waveform/vector monitor as follows:

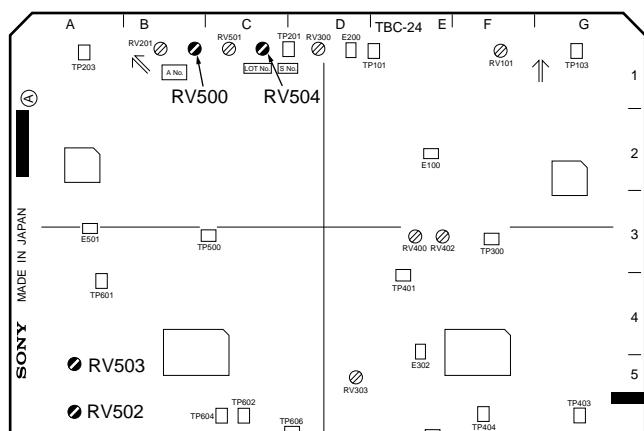
WAVEFORM mode, INPUT: CH-A, INT REF, SWEEP : 2 H, MAG: ON

LINE SELECT: 183 to 202 for NTSC/218 to 241 for PAL

- (6) Set RV502 (A-5) on TBC-24 board to the specified position as shown below.



TBC-24 Board (A Side) (Suffix-11 and -12)

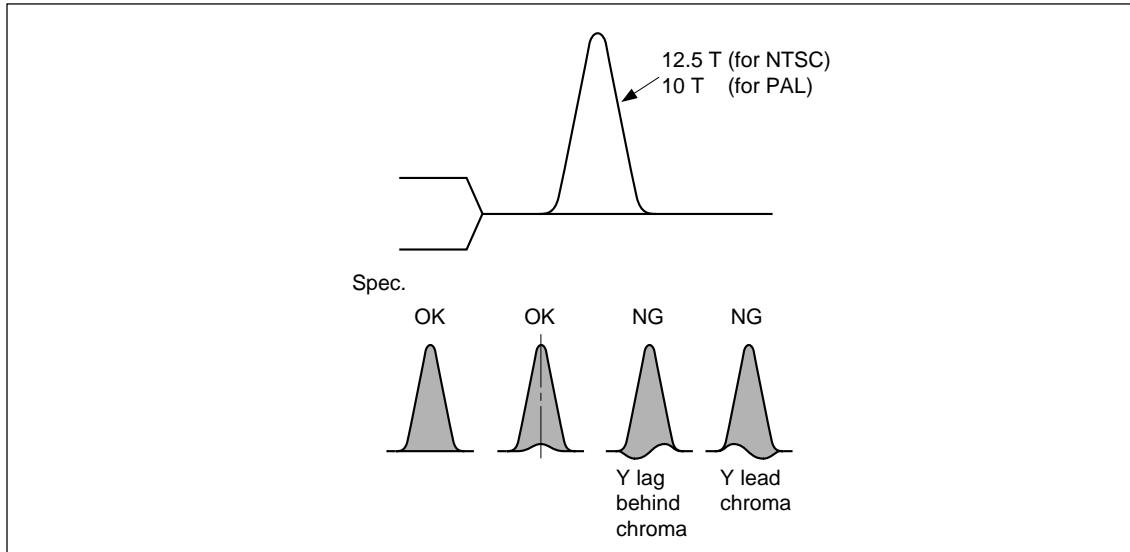


TBC-24 Board (A Side) (Suffix-13 and Higher)

**METAL adjustment [to step (19)]**

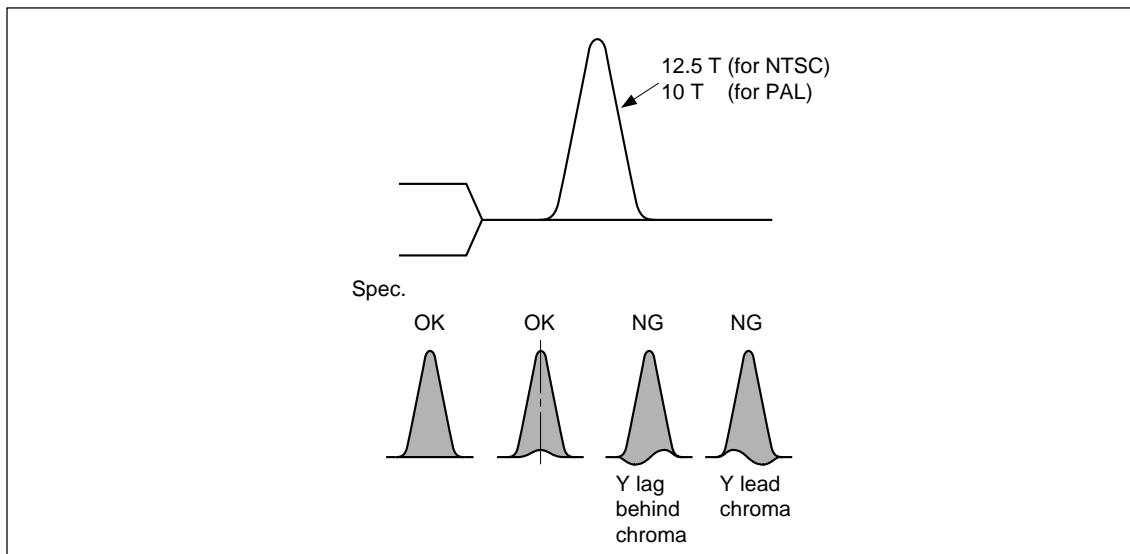
- (7) Playback the bowtie signal portion (17:00 to 19:00) of the alignment tape CR5-1B or CR5-1B PS.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)
- (8) Observe the 12.5T (PAL: 10T) portion of bowtie signal, adjust so that the waveform satisfies the specification.

Adjustment point: **●RV503/TBC-24(A-5)**



- (9) Observe the 12.5T (PAL: 10T) portion of bowtie signal, adjust so that the waveform satisfies the specification.

Adjustment points: Field 1: **●RV500/TBC-24(B-1)**  
Field 2: **●RV504/TBC-24(C-1)**



If the specification is not satisfied by adjusting RV500, perform steps (10) through (13) after setting RV500 to the mechanical center.

**Note**

RV504 is not equipped with the board number suffixes 11 and 12 of TBC-24 board.  
Therefore, adjust RV500 only.

Perform following steps (10) through (13) when the specification in step (9) is not satisfied.

- (10) Playback the bowtie signal portion (17:00 to 19:00) of the alignment tape CR5-1B or CR5-1B PS again.
- (11) Enter the maintenance mode, then enter A37 : TBC VR.
- (12) The data value of item “SQ C RZ” is within +2 or -2.
- (13) Perform step (9) again.

**Data save [to step (18)]:**

Perform the data save only when SQ C RZ’s data value of A37 : TBC VR is changed.

- (14) To exit A37 : TBC VR, push the MENU button on the lower control panel.
- (15) Enter A3F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.
- (16) Check that the message “Save Complete” is displayed on the video monitor.
- (17) To exit A3F : NV-RAM CONTROL, push the MENU button once.
- (18) To exit the maintenance mode, push the MENU button three times again.

- (19) Stop the playback of the alignment tape CR5-1B/CR5-1B PS or eject it.

**Note**

It is not necessary to eject the alignment tape when perform subsequent “7. Impact Error Offset Adjustment”.

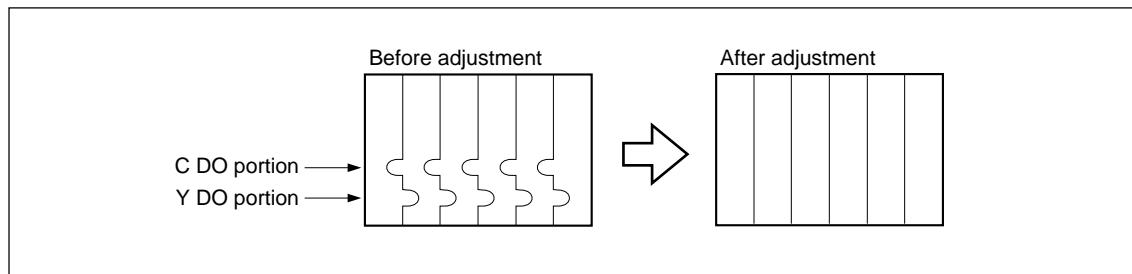
## 7. Impact Error Offset Adjustment

Measuring equipment: Video monitor

- (1) Playback the color-bar signal portion (26:00 to 28:00) of the alignment tape CR5-1B or CR5-1B PS.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)
- (2) Adjust the following RVs until disappear the drop-out parts (Y DO and C DO) of displaying color-bar on the video monitor.

Adjustment points: Y DO: **•RV401/TBC-24(F-6)**  
C DO: **•RV601/TBC-24(D-6)**

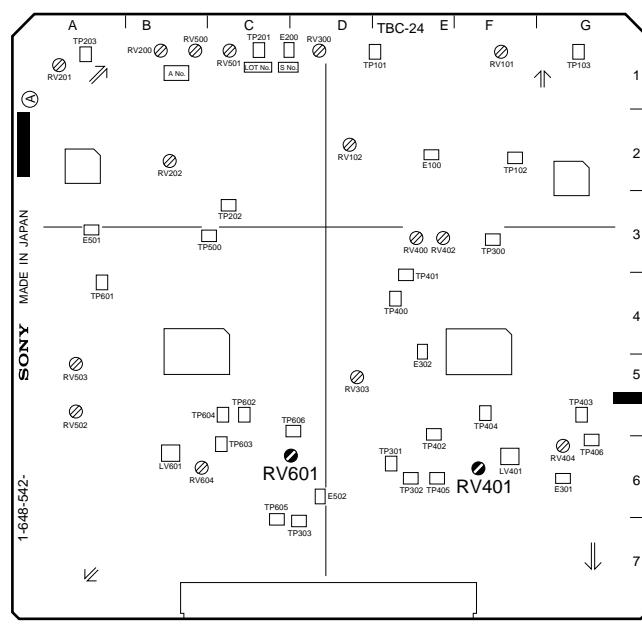
Specification: Refer to next figure.



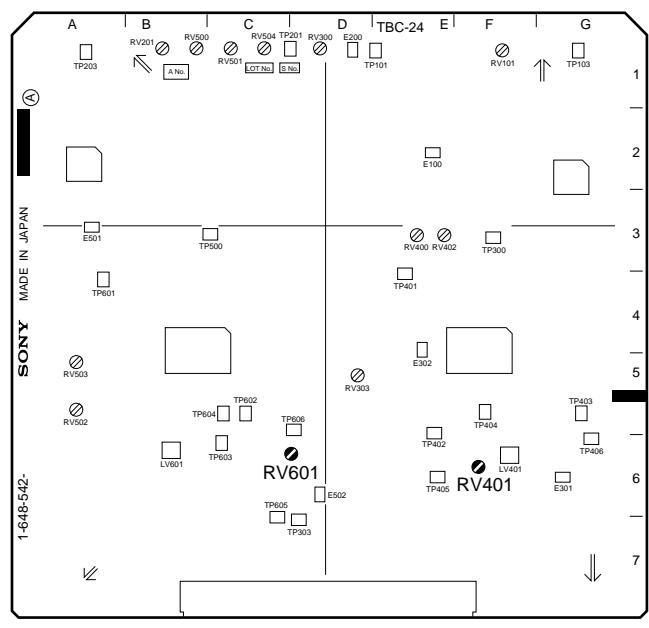
- (3) Eject the alignment tape CR5-1B/CR5-1B PS.

**Note**

It is not necessary to eject the alignment tape when perform subsequent “8. TBC Y/C Delay Adjustment”.



TBC-24 Board (A Side) (Suffix-11 and -12)



TBC-24 Board (A Side) (Suffix-13 and higher)

## 8. TBC Y/C Delay Adjustment

**Note**

Perform this adjustment without using the extension board.

Measuring equipments: Composite waveform monitor

- (1) Turn off the power of DNW.
- (2) Disconnect the extension harness from TBC-23 board and TBC-24 board.
- (3) Remove the TBC-24 board from the extension board, then pull out the extension board.
- (4) Install the TBC-24 board to DNW.
- (5) Connect originally harness to CN1 on TBC-24 board and CN1 on TBC-23 board.
- (6) Turn on the power.
- (7) Set the composite waveform/vector monitor as follows:

WAVEFORM mode, INPUT: CH-A, INT REF, SWEEP : 2 H, MAG: ON

LINE SELECT: 183 to 202 for NTSC/218 to 241 for PAL

**METAL adjustment [to step (10)]**

- (8) Playback the bowtie signal portion (17:00 to 19:00) of the alignment tape CR5-1B or CR5-1B PS.  
(DNW-A22: CR5-1B, DNW-A22P: CR5-1B PS)
- (9) Observe the 12.5T (PAL: 10T) portion of bowtie signal, adjust so that the waveform satisfies the specification.

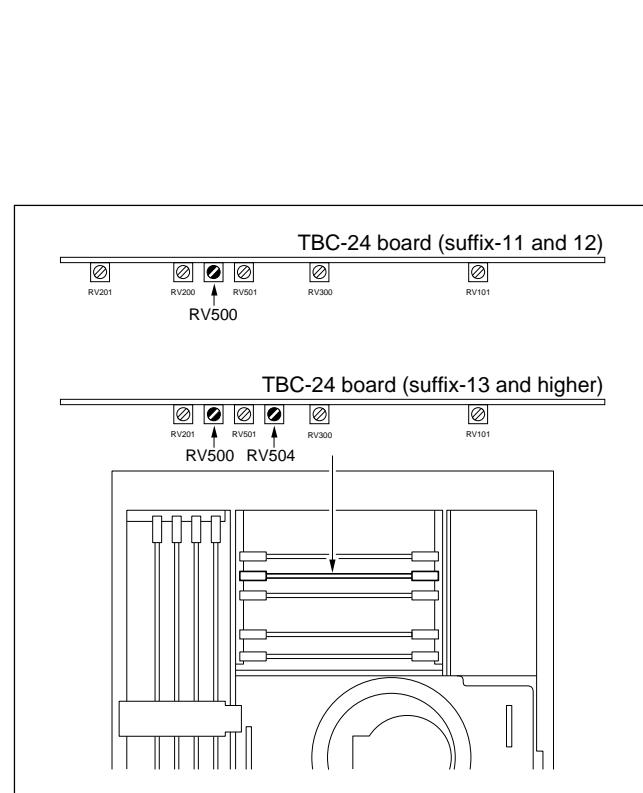
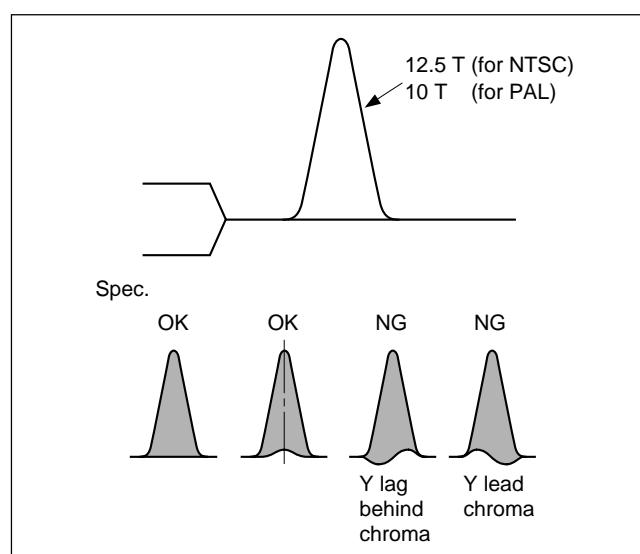
Adjustment points: Field 1: **RV500/TBC-24(B-1)**

Field 2: **RV504/TBC-24(C-1)**

**Note**

RV504 is not equipped with the board number suffixes 11 and 12 of TBC-24 board.

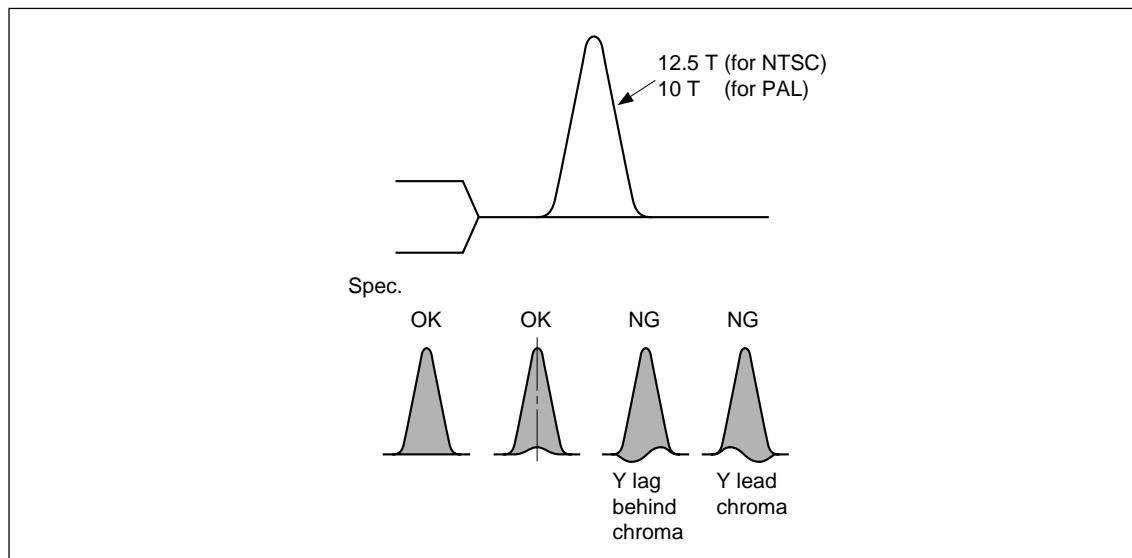
Therefore, adjust RV500 only.



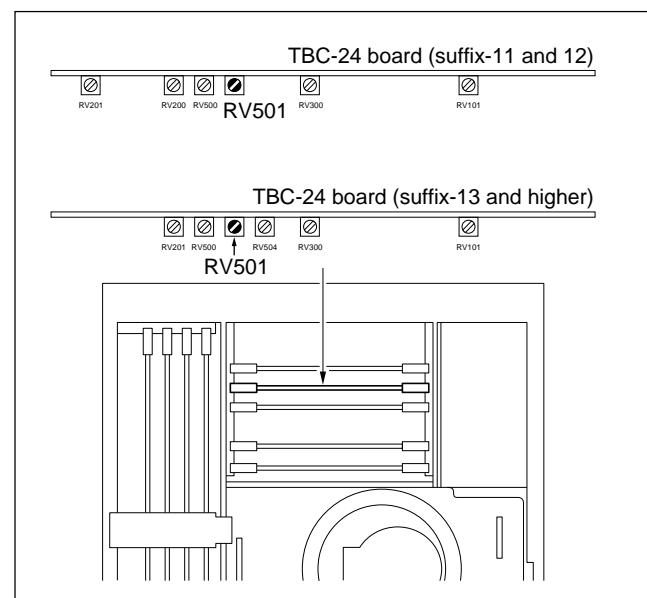
**RV500 and RV504 on TBC-24 Board**

**OXIDE adjustment [to step (13)]**

- (11) Playback the bowtie signal portion (6:00 to 9:00) of the alignment tape CR5-2A or CR5-2A PS.  
 (DNW-A22: CR5-2A, DNW-A22P: CR5-2A PS)
- (12) Observe the 12.5T (PAL: 10T) portion of bowtie signal, adjust so that the waveform satisfies the specification.
- Adjustment point: **RV501/TBC-24(C-1)**



- (13) Eject the alignment tape CR5-2A/CR5-2A PS.

**RV501 on TBC-24 Board**

## 6-8. VPR-17 Board Replacement

The electrical adjustments are essential after the VPR-17 board is replaced.

**Note**

When the VPR-17 board is replaced, the adjustments for both 525/60 and 625/50 line systems are required. Be sure to perform all adjustments to maintain the all functions even if that DNW is not carried out the 525/625 line system switching.

In the section 6-9, expresses the 525/60 and 625/50 line systems as follows:

Model	525/60 line system	625/50 line system
DNW-A22	Standard system	Another system
DNW-A22P	Another system	Standard system

To performed the electrical adjustments, the following equipment and fixtures are required

- Composite waveform/vector monitor  
For DNW-A22: TEKTRONIX 1750, 1780R, or equivalent  
For DNW-A22P: TEKTRONIX 1751, 1781R, or equivalent
- Oscilloscope: TEKTRONIX 2465B or equivalent
- Frequency counter: ADVANTEST TR5821AK or equivalent
- Extension board: EX-555 (SONY part No. A-8277-211-A)
- 75 Ω terminators (3 pcs.)
- 75 Ω BNC T adapter (1 pc.)
- Composite video monitor(s): Sony's BVM series, PVM series, etc.

**Notes**

- For NTSC (525/60 line system) and PAL (625/50 line system) are required.
- Having the switchable monitor of the NTSC and PAL is a convenience.

### 6-8-1. Replacement Procedure

**Note**

Turn off the POWER switch before starting the replacement.

- (1) Remove the upper lid and board retainer(L). (Refer to “6-1-3. Plug-in Board Pulling out/Insertion”.)
- (2) Replace the VPR-17 board. (Refer to Section 6-1-3.)
- (3) Perform the electrical adjustments (Section 6-8-2).

**Note**

The extension board is used some part of the electrical adjustments.

- (4) Return the states of S1100-1 on the SS-63 board, control panels, and connector panel to their previous states.
- (5) Turn off the POWER switch.
- (6) Install the board retainer(L) and upper lid. (Refer to Section 6-1-3.)

## 6-8-2. Electrical Adjustments

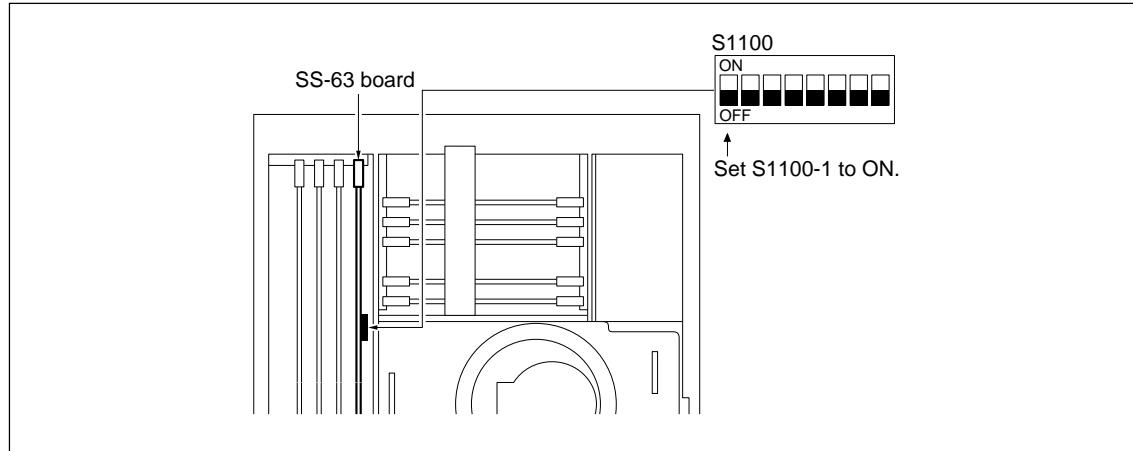
### Adjustment Items

No.	Item	Adjustment point	Notes
0	Preparation		
1	Composite video output level adjustment		
	CH1	A20 : VPR VR : VIDEO 1 LEVEL	VIDEO OUTPUT COMPOSITE 1
	CH2	A20 : VPR VR : VIDEO 2 LEVEL	VIDEO OUTPUT COMPOSITE 2
	Data save	A2F : NV-RAM CONTROL	
2	Standard system completion		
3	Preparation (Another system)		
4	Composite video output level adjustment (Another system)		
	CH1	A20 : VPR VR : VIDEO 1 LEVEL	VIDEO OUTPUT COMPOSITE 1
	CH2	A20 : VPR VR : VIDEO 2 LEVEL	VIDEO OUTPUT COMPOSITE 2
	Data save	A2F : NV-RAM CONTROL	
5	Another system completion		

## 0. Preparation

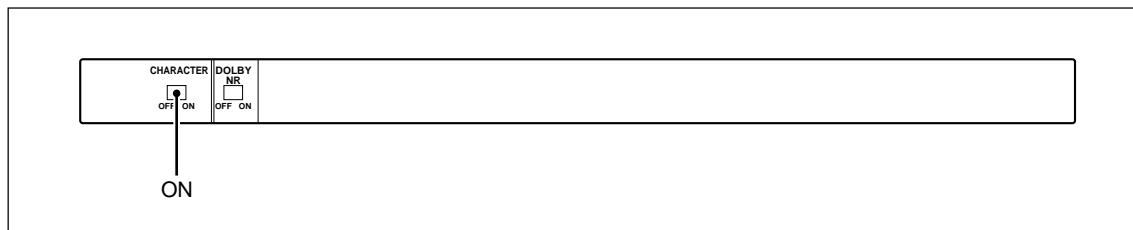
### Setting of DNW

- (1) Set S1100-1 on SS-63 board to ON to treat the extended menu of the setup menu.



S1100 on SS-63 Board

- (2) Set the sub control and connector panels as shown below.



Sub Control Panel

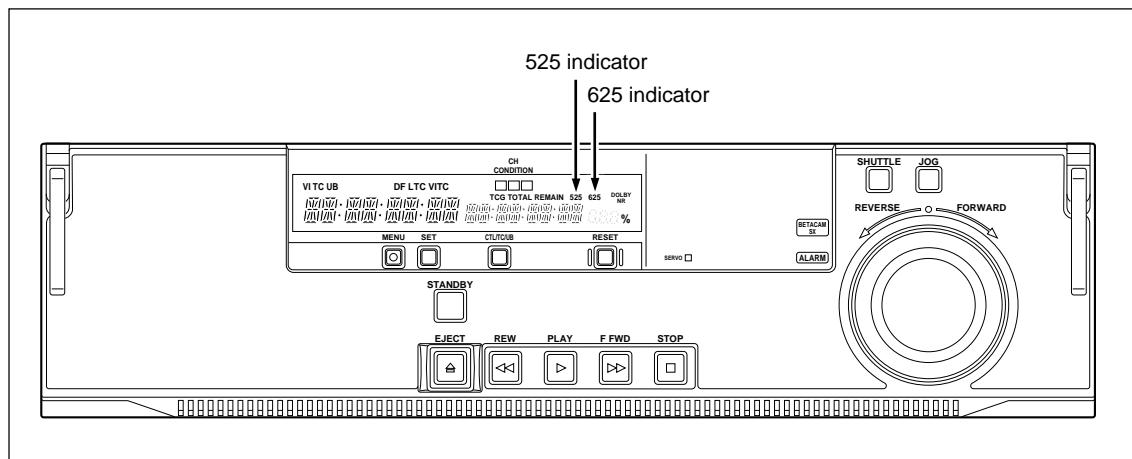
- (3) Turn on the POWER switch of DNW, then confirm that the operation system is in the standard system.

**Note**

The operation system can confirm with the 525 or 625 indicator on the lower control panel.

If DNW is under another system, return it to the standard system with the setup menu ITEM-013 : 525/625 SYSTEM SELECT. (Refer to Section 7-2-2 in the operation manual.)

Model	Standard system	Another system
DNW-A22	Lights 525 indicator	Lights 625 indicator
DNW-A22P	Lights 625 indicator	Lights 525 indicator



Lower Control Panel

## For the maintenance mode

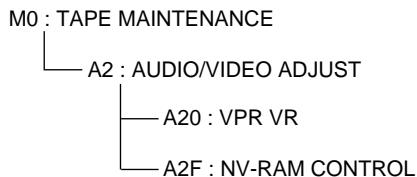
Describes the operation of the maintenance mode as follows:

### • How to enter the maintenance mode

Push S1101 (G-1) on the SS-63 board.

**Note**

The sub modes and menus of the maintenance mode that are used after replacing the VPR-17 are as shown below.



### • How to enter the next menu

(1) Push the JOG button once. = **Search dial enters into JOG mode.**

(2) To set the cursor (\* mark) to the desired menu (mode), turn the search dial.

(3) Push the SET button once.

### • How to exit the current menu (mode)

Push the MENU button once.

**Note**

If the MENU button is pushed several times, the maintenance mode exits.

### • How to change the data value

(1) To set the cursor (\* mark) to the item, turn the search dial.

(2) Turn the search dial slowly while pressing the JOG button. = **Data value changes.**

REVERSE direction: decrease the data value (00's next is FF)

FORWARD direction: increase the data value (FF's next is 00)

**Note**

During adjustment, change the rotational direction of the search dial according to the change of waveform that is displayed on the measuring equipment.

### • How to save the data

(1) To set the cursor (\* mark) to A2F : NV-RAM CONTROL, turn the search dial.

(2) Push the SET button once.

(3) To set the cursor (\* mark) to “SAVE ALL ADJUST DATA”, turn the search dial.

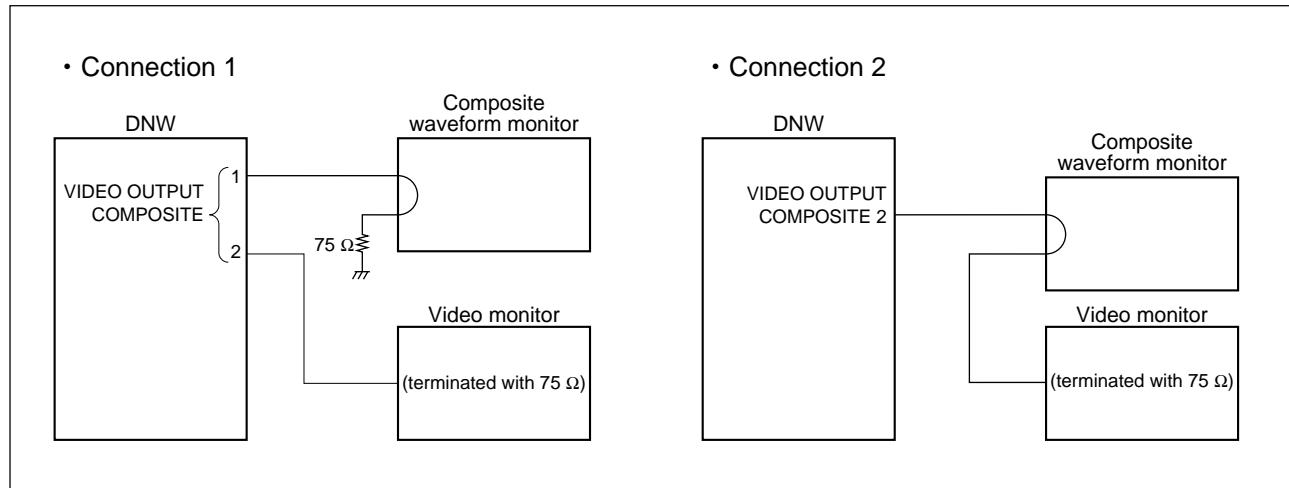
(4) Push the SET button once.

## 1. Composite Video Output Level Adjustment

**Note**

More than 30 minutes should elapse after turning the power on, then perform the adjustment (confirmation).

Measuring equipment: Composite waveform monitor



- (1) Connect the composite waveform monitor and video monitor as shown above figure's Connection 1.
- (2) Playback the 100 % color-bar portion (0:00 to 10:00) of the alignment tape SR5-1 or SR5-1P  
SR5-1: for DNW-A22  
SR5-1P: for DNW-A22P
- (3) To enter the maintenance mode, push S1101 (G-1) on the SS-63 board.
- (4) Enter A2 : AUDIO/VIDEO ADJUST.
- (5) Enter A20 : VPR VR.

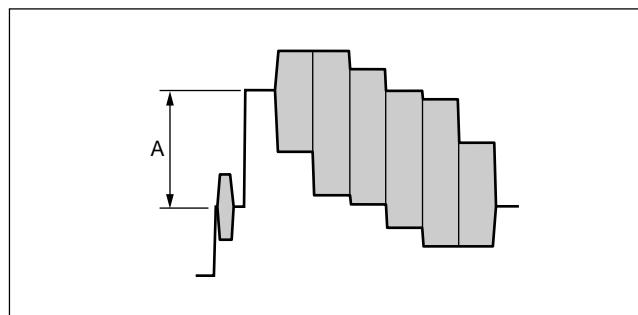
## (6) Confirmation (Adjustment)

Connect the composite waveform monitor to each VIDEO OUTPUT COMPOSITE connector, confirm that the white peak level satisfy the specification.

If the specification is not satisfied, perform the adjustment.

- When confirming/adjusting the output of VIDEO OUTPUT COMPOSITE 2 connector, change the connection of the video monitor as Connection 2 on the opposite page.
- The picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 2 connector. But, it is no problem to confirm the white peak level of the color bars signal.

Observation channel [Connection]	Adjustment point (A20 : VPR VR)	Specification for DNW-A22	Specification for DNW-A22P
COMPOSITE 1 [Connection 1]	VIDEO 1 LEVEL	A = 100 ±1 IRE	A = 700 ±7 mV
COMPOSITE 2 [Connection 2]	VIDEO 2 LEVEL	(A = 714 ±7 mV)	



(7) To exit the A20 : VPR VR, push the MENU button once.

(8) Eject the alignment tape.

When performing the adjustment in step (6), perform following steps (9) through (12).

(9) Data save

Enter A2F : NV-RAM CONTROL, then execute “SAVE ALL ADJUST DATA”.

(10) Check that the message “Save Complete” is displayed on the video monitor.

(11) To exit the A2F : NV-RAM CONTROL, push the MENU button once.

(12) To exit the maintenance mode, push the MENU button three times.

---

## 2. Standard System Completion

- (1) Turn off the POWER switch of DNW.
- (2) Remove the VPR-17 board from the extension board, then pull out the extension board.
- (3) Install the VPR-17 board .

---

## 3. Preparation (Another System)

- (1) Turn on the POWER switch of DNW.
- (2) Switch DNW to another system with the setup menu ITEM-013.

(Refer to Section 7-2-2 in the operation manual.)

**Note**

Another system for DNW-A22 is the 625/50 line system.

Another system for DNW-A22P is the 525/60 line system.

- (3) Connect the video monitor corresponding to another system to VIDEO OUTPUT COMPOSITE 2 connector.
- Or, when using the switchable video monitor of NTSC (525/60) and PAL (625/50), switch its system.

- (4) Setup extended menu setting (Another system)

For DNW-A22: None.

For DNW-A22P:

Set the SUB-ITEMs of ITEM-709 and ITEM-713 as shown below.

**Note**

Return the SUB-ITEMs to their previous settings in “12. Another System Completion” (after adjustments in another system are completed) .

ITEM	SUB-ITEM	Setting Previous setting (fill up)
709 : CAV LEVEL FORMAT	1. OUTPUT CAV LEVEL	B-CAM
713 : VIDEO SETUP REFERENCE LEVEL	0. MASTER LEVEL	0.0%
	3. BETACAM PB LEVEL	MSTER
	4. OUTPUT LEVEL	MSTER

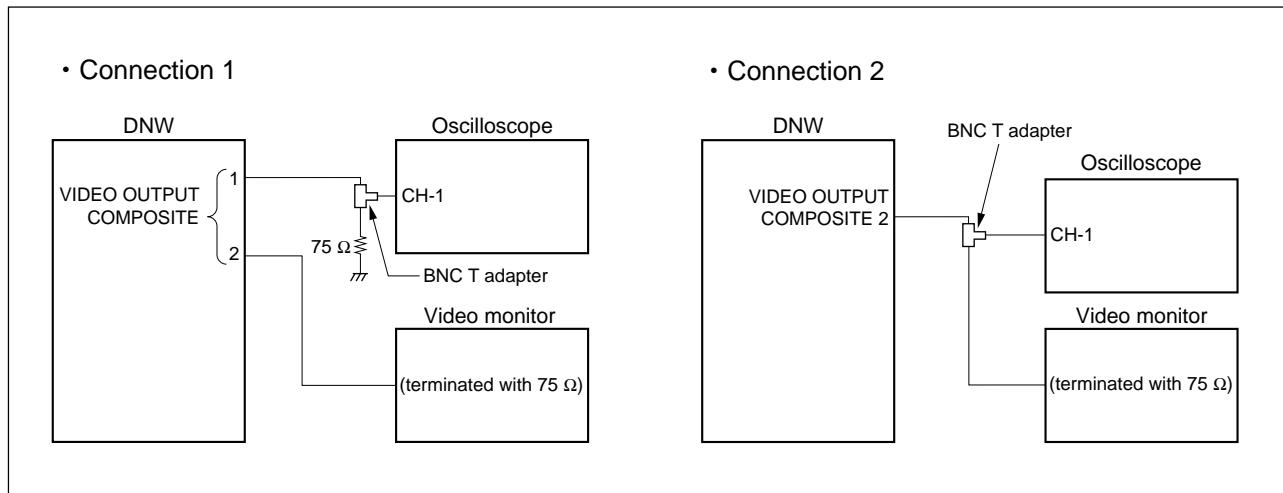
#### 4. Composite Video Output Level Adjustment (Another System)

Measuring equipment: Oscilloscope (Band width limit: ON)

**Note**

If the composite waveform monitor corresponding to another system is available, be sure to use it.

In this case, the connection is the same connection as "1. Composite Video Output Level Adjustment".



- (1) Connect the oscilloscope (and video monitor) as shown above figure's Connection 1.
- (2) Set the oscilloscope as follows:
  - CH-1: DC 200 mV/DIV, 10 µs/DIV
  - Trigger: CH-1, - slope, coupling: LINE
- (3) Playback the 100 % color-bar portion (0:00 to 10:00) of the alignment tape SR5-1 or SR-5-1P.
  - SR5-1: for DNW-A22P
  - SR5-1P: for DNW-A22
- (4) To enter the maintenance mode, push S1101 (G-1) on the SS-63 board.
- (5) Enter A2 : AUDIO/VIDEO ADJUST.
- (6) Enter A20 : VPR VR.



## (7) Confirmation (Adjustment)

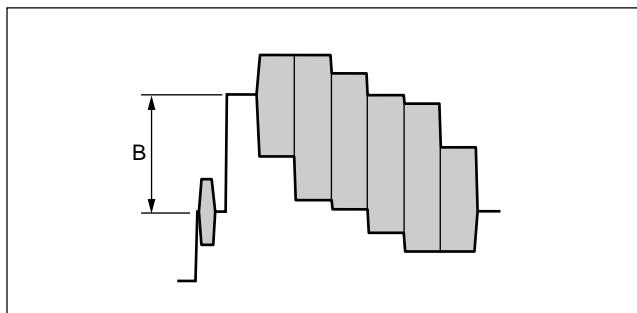
Connect the Oscilloscope's CH-1 to each VIDEO OUTPUT COMPOSITE connector, confirm that the white peak level satisfy the specification.

If the specification is not satisfied, perform the adjustment.

**Notes**

- When confirming/adjusting the output of VIDEO OUTPUT COMPOSITE 2 connector, change the connection of the video monitor as Connection 2 on the opposite page.
- The picture of the maintenance mode is superimposed in the output of VIDEO OUTPUT COMPOSITE 2 connector. But, it is no problem to confirm the white peak level of the color bars signal.

Observation channel [Connection]	Adjustment point (A20 : VPR VR)	Specification for DNW-A22	Specification for DNW-A22P
COMPOSITE 1 [Connection 1]	VIDEO 1 LEVEL	$B = 700 \pm 7 \text{ mV}$	$B = 714 \pm 7 \text{ mV}$
COMPOSITE 2 [Connection 2]	VIDEO 2 LEVEL		



## (8) To exit the A20 : VPR VR, push the MENU button once.

## (9) Eject the alignment tape.

When performing the adjustment in step (7), perform following steps (10) through (13).

## (10) Data save

Enter A2F : NV-RAM CONTROL, then execute "SAVE ALL ADJUST DATA".

## (11) Check that the message "Save Complete" is displayed on the video monitor.

## (12) To exit the A2F : NV-RAM CONTROL, push the MENU button once.

## (13) To exit the maintenance mode, push the MENU button three times.

---

**5. Another System Completion**

## (1) Setup extended menu resetting (Another system)

For DNW-A22: None.

For DNW-A22P:

Return the SUB-ITEMs of the setup extended menus ITEM-709 and ITEM-713 to their previous settings in another system.

## (2) Return DNW to the standard system with setup extended menu ITEM-013.

(Refer to Section 7-2-2 in the operation manual.)

**Note**

Standard system for DNW-A22 is the 525/60 line system.

Standard system for DNW-A22P is the 625/50 line system.



## **Section 7**

### **Spare Parts**

#### **7-1. Notes on Repair Parts**

##### **1. Safety Related Components Warning**

Components marked  $\Delta$  are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

##### **2. Standardization of Parts**

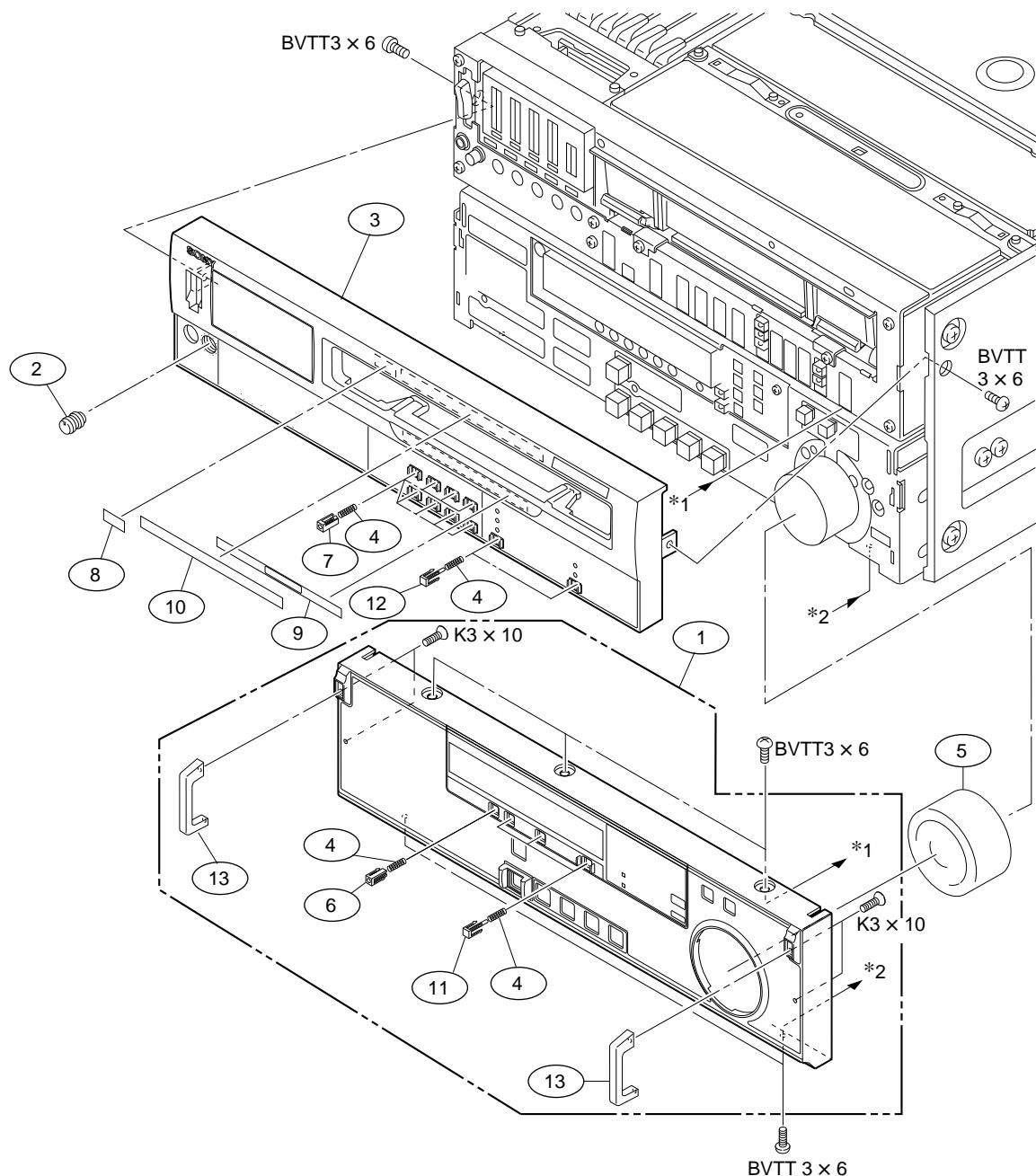
Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.

Parts list has the present standardized repair parts.

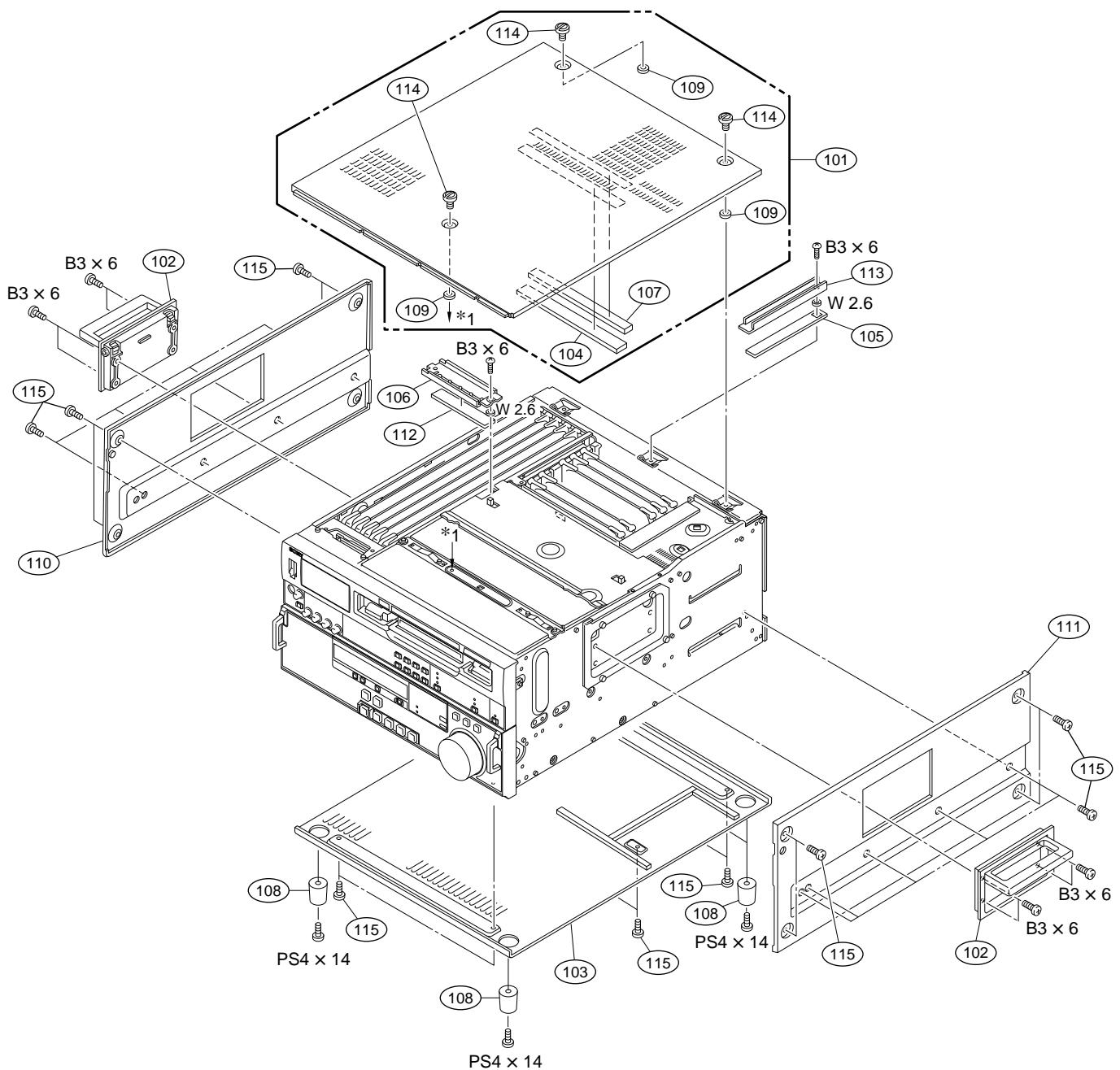
##### **3. Stock of Parts**

Parts marked with "o" at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

## 7-2. Exploded Views



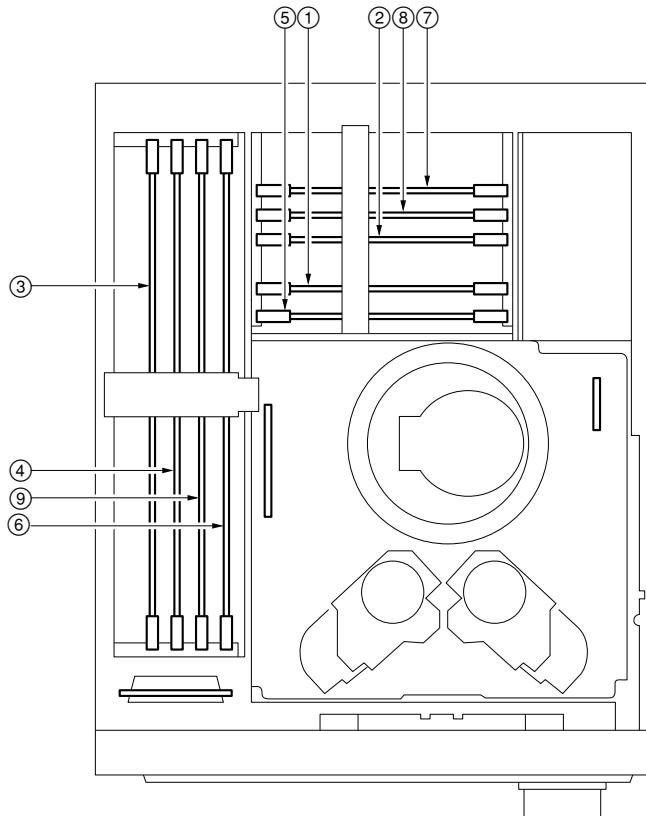
No.	Part No.	SP Description	No.	Part No.	SP Description
1	A-8278-612-C	o PANEL ASSY, KEY	11	3-696-774-01	s KEY TOP, 6x6(BLACK)
2	X-3167-825-1	o KNOB ASSY(WHITE), VOL	12	3-696-774-11	s KEY TOP, 6x6(GRAY)
3	X-3679-317-2	o PANEL SUB ASSY, FRONT	13	3-717-425-31	o HANDLE
4	2-217-533-00	s SPRING, COMPRESSION		7-685-247-19	s SCREW +K 3x10 TAPPING TYPE2
5	3-180-633-04	s RUBBER, DIAL KNOB		7-685-871-09	s SCREW +BVTT 3x6(S)
6	3-180-822-03	s KEY TOP, 6x6(LED,BLACK)			
7	3-180-822-11	s KEY TOP, 6x6(LED,GRAY)			
8	3-184-994-02	o ISR STICKER (S)			
9	3-604-813-02	o A/D LABEL			
10	3-608-553-01	o LABEL, MODEL NUMBER(for NTSC)			
	3-608-552-01	o LABEL, MODEL NUMBER(for PAL)			



No.	Part No.	SP Description	No.	Part No.	SP Description
101	A-8278-584-A	o LID ASSY, UPPER	111	3-696-854-01	o RIGHT CABINET
102	X-3642-018-3	o HANDLE ASSY	112	3-696-882-02	o CUSHION(L), PC BOARD RETAINER
103	X-3678-563-3	o PLATE ASSY, BOTTOM	113	3-696-887-01	o RETAINER(S), PC BOARD
104	3-171-369-02	o LID(A), UPPER, AIR GUARD	114	3-717-392-02	o SCREW, LID
105	3-171-410-01	o RETAINER(S), PC BOARD(CUSHION)	115	3-733-690-01	s SCREW, +B 4x6
106	3-180-641-01	o PLATE(L), PC BOARD RETAINER	7-623-923-01	s WASHER 2.6, NYLON	
107	3-604-811-01	o LID(B), UPPER, AIR GUARD	7-682-547-09	s SCREW +B 3x6	
108	3-604-930-01	s FOOT, RUBBER	7-682-664-01	s SCREW +PS 4x14	
109	3-688-102-01	o SPACER, M4			
110	3-696-847-02	o CABINET (LEFT)			

### 7-3. Plug-in Boards

No.	Board name	Part No.	SP Description
1	APR-12	A-8315-610-A	o MOUNTED CIRCUIT BOARD, APR-12F (for NTSC)
		A-8315-691-A	o MOUNTED CIRCUIT BOARD, APR-12FP (for PAL)
2	DM-89	A-8312-743-A	o MOUNTED CIRCUIT BOARD, DPR-71D
3	DPR-71	A-8312-743-A	o MOUNTED CIRCUIT BOARD, DPR-71D
4	DPR-73	A-8315-614-A	o MOUNTED CIRCUIT BOARD, DPR-73F
5	EQ-56	A-8315-169-A	o MOUNTED CIRCUIT BOARD, EQ-56F
6	SS-63	A-8273-560-A	o MOUNTED CIRCUIT BOARD, SS-63
7	TBC-23	A-8275-155-B	o MOUNTED CIRCUIT BOARD, TBC-23 (for NTSC)
		A-8275-271-B	o MOUNTED CIRCUIT BOARD, TBC-23PG (for PAL)
8	TBC-24	A-8275-156-A	o MOUNTED CIRCUIT BOARD, TBC-24 (for NTSC)
		A-8275-087-A	o MOUNTED CIRCUIT BOARD, TBC-24P (for PAL)
9	VPR-17	A-8315-612-A	o MOUNTED CIRCUIT BOARD, VPR-17F (for NTSC)
		A-8315-693-A	o MOUNTED CIRCUIT BOARD, VPR-17FP (for PAL)



< Top View >

## 7-4. Packing Materials and Supplied Accessories

Ref. No. or Q'ty	Part No.	SP Description
4pcs	7-682-965-01	s SCREW +PSW 4x16

## 7-5. Fixtures List

Part No.	SP Description
J-6035-070-A	o EXTRACTION TOOL (for PLCC socket)
J-6080-029-A	o SMALL DENTAL MIRROR (Round type ø12)
J-6086-570-A	o REFERENCE FLAT PLATE
J-6152-450-A	o WIRE CLEARANCE CHECK GAUGE SET
J-6251-090-A	o TORQUE SCREWDRIVER'S HEXAGONAL BIT (d=2.5 mm, l=120 mm)
J-6323-440-A	o TORQUE SCREWDRIVER'S HEXAGONAL BIT (d=0.89 mm, l=90 mm)
J-6323-420-A	o TORQUE SCREWDRIVER'S BIT (+2 mm, l=75 mm)
J-6323-430-A	o TORQUE SCREWDRIVER'S BIT (+3 mm, l=90 mm)
J-6252-510-A	o TORQUE SCREWDRIVER (6 kg•cm) (0.6 N•m)
J-6252-520-A	o TORQUE SCREWDRIVER (12 kg•cm) (1.2 N•m)
J-6269-810-A	o EXTENSION BOARD (S), EX-377
A-8277-211-A	o EXTENSION BOARD (L), EX-555
A-8277-212-A	o EXTENSION BOARD (S), EX-556
J-6320-870-A	o REEL MOTOR SHAFT SLANTNESS CHECK FIXTURE
J-6320-880-A	o CASSETTE REFERENCE PLATE (L)
J-6322-610-A	o TAPE GUIDE ADJUSTMENT DRIVER
J-6329-350-A	o REEL TABLE HEIGHT GAUGE
1-952-684-11	o EXTENSION CABLE (14P)
1-957-071-11	o EXTENSION CABLE SET
3-184-527-01	o CLEANING CLOTH (15 cm x 15 cm)
7-432-114-11	o LOCKING COMPOUND, 1401B (200 g)
7-661-018-18	o DIAMOND OIL, NT-68 (50 ml)
7-651-000-10	o SONY GREASE, SGL-601 (50 g)
7-700-736-01	o L-SHAPED HEXAGONAL WRENCH (d=1.27 mm)
7-700-736-05	o L-SHAPED HEXAGONAL WRENCH (d=1.5 mm)
7-700-736-06	o L-SHAPED HEXAGONAL WRENCH (d=0.89 mm)
7-700-766-04	o HEXAGONAL WRENCH DRIVER (d=2.5 mm)
8-960-075-01	o ALIGNMENT TAPE, SR5-1 (for 525/60 system)
8-960-075-11	o ALIGNMENT TAPE, SR2-1 (for 525/60 system)
8-960-075-51	o ALIGNMENT TAPE, SR5-1P (for 625/50 system)
8-960-075-61	o ALIGNMENT TAPE, SR2-1P (for 625/50 system)
8-960-096-01	o ALIGNMENT TAPE, CR2-1B (for DNW-A22 only)
8-960-096-41	o ALIGNMENT TAPE, CR5-1B (METAL PARTICLE TAPE) (for DNW-A22 only)
8-960-096-51	o ALIGNMENT TAPE, CR2-1B PS (for DNW-A22P only)
8-960-097-44	o ALIGNMENT TAPE, CR5-2A (OXIDE TAPE) (for DNW-A22 only)
8-960-097-45	o ALIGNMENT TAPE, CR8-1A (OXIDE TAPE) (for DNW-A22 only)
8-960-096-91	o ALIGNMENT TAPE, CR5-1B PS (METAL PARTICLE TAPE) (for DNW-A22P only)
8-960-096-86	o ALIGNMENT TAPE, CR8-1B PS (METAL PARTICLE TAPE) (for DNW-A22P only)
8-960-098-44	o ALIGNMENT TAPE, CR5-2A PS (OXIDE TAPE) (for DNW-A22P only)
8-960-098-45	o ALIGNMENT TAPE, CR8-1A PS (OXIDE TAPE) (for DNW-A22P only)
9-911-053-00	o THICKNESS GAUGE
9-919-573-01	o CLEANING LIQUID



## Appendix A

### Setting Check Sheet

It is recommended to copy these check sheets and write down the setup conditions (switch and so on) under the application.

If the setting is changed temporarily by changing operating condition, the setting can be reset easily.

It is recommended to attach the sheets to the unit when check, maintenance and repair.

If the unit is used frequently by changing the combination of each system, making the sheets are convenient.

(Make use of the check sheets in prevention of setting error.)

Model name: DNW- \_\_\_\_\_ Serial No.: \_\_\_\_\_

- Software

SYS1 ROM version: \_\_\_\_\_

SYS2 ROM version: \_\_\_\_\_

SV1 ROM version: \_\_\_\_\_

- RS-232C baud rate: \_\_\_\_\_ bps

- Hours meter

Write down the value of hours meter when checking, servicing and maintaining.

ITEM	Date	Hours meter
H01: OPERATION HOURS	/	
H02: DRUM RUNNING HOURS	/	
H03: TAPE RUNNING HOURS	/	
H04: THREADING COUNTER	/	
H12: DRUM RUNNING HOURS(Resettable)	/	
H13: TAPE RUNNING HOURS(Resettable)	/	
H14: THREADING COUNTER(Resettable)	/	
H15: AIRFILTER OPERATION HOURS(Resettable)	/	

## Upper control panel

Switch		Factory setting	Setting			
AUDIO MONITOR	L	CH-1	<input type="checkbox"/> CH-1	<input type="checkbox"/> CH-2	<input type="checkbox"/> CH-3	<input type="checkbox"/> CH-4
	R	CH-2	<input type="checkbox"/> CH-1	<input type="checkbox"/> CH-2	<input type="checkbox"/> CH-3	<input type="checkbox"/> CH-4
TC		LTC	<input type="checkbox"/> LTC		<input type="checkbox"/> VITC	
DF/NDF		DF	<input type="checkbox"/> DF	<input type="checkbox"/> NDF		

## Sub control panel

Switch		Factory setting	Setting	
CHARACTER		ON	<input type="checkbox"/> OFF	<input type="checkbox"/> ON
DOLBY NR		ON	<input type="checkbox"/> OFF	<input type="checkbox"/> ON

## Short plugs on the board

**Note** Never change the setting of Factory use switches.

Board	Name	Ref.No./channel	Factory setting	Setting
APR-12	Audio input headroom	COR101/CH1	20 dB	
		COR201/CH2	20 dB	
	Monitor output level	L COR302	+4 dBm/600 Ω	
		R COR402	+4 dBm/600 Ω	
	Monitor output headroom	L COR300gM	20 dB	
		R COR400	20 dB	
	Variable monitor output level	L COR301	Fixed (UNITY)	
		R COR401	Fixed (UNITY)	
	HEAD TUNE Switch	S500/CH1	Factory use	—
		S600/CH2	Factory use	—
SS-63	Factory use	COR100	OPEN	—
	Factory use	COR101	OPEN	—
	Factory use	COR102 <sup>*1</sup>	OPEN	—
	Factory use	COR103 <sup>*1</sup>	SHORT <sup>*2</sup>	—
	Factory use	COR104 <sup>*1</sup>	SHORT <sup>*2</sup>	—

\*1: Board number 1-661-127-13 only.

\*2: COR103 and 104 have no plug, but are shorted by pattern.

## Switches on the board

**Note** Never change the setting of Factory use switches.

Board	Switch No.: Name	Factory setting	Setting
DM-89	S101 : Y-RF LPF & EQ TEST	NORMAL POSITION	-
	S102 : Factory use	NORMAL POSITION	-
	S301 : C-RF LPF & EQ TEST	NORMAL POSITION	-
	S302 : Factory use	NORMAL POSITION	-
	S501 : Factory use	ON	-
	S901 1 – 4: Factory use	OFF (OPEN)`	-
TBC-23	S1 1 : Y MUTE	OFF (OPEN)	-
	2 : C MUTE	OFF (OPEN)	-
	3 : Factory use	OFF (OPEN)	-
	4 : Factory use	OFF (OPEN)	-
	5 : COMB	OFF (OPEN)	-
	6 : TBC TEST	OFF (OPEN)	-
	7 : Factory use	OFF (OPEN)	-
	8 : VIDEO PHASE	OFF (OPEN)	-
	S500 1 – 4: Factory use	OFF (OPEN)	-
SS-63	S101 1 <sup>*1</sup> : FLASH MEMORY	OFF (OPEN)	-
	2 : ANA AUTO-TRACKING	ON (CLOSE)	-
	3 : ANA DISABLE	OFF (OPEN)	-
	4 <sup>*2</sup> : SV ERR DISABLE	OFF (OPEN)	-
	S1100 1 : EXTENDED MENU	OFF (OPEN)	-
	2 : MAINT MODE ACCESS	OFF (OPEN)	-
	3 – 8: Factory use	OFF (OPEN)	-
	S1102 Never change the settings of S1102 switch since each switch is set according to the characteristics of the unit.		
	1 – 6: Model ID switch	1: OFF (OPEN) 2: OFF (OPEN) 3: OFF (OPEN) 4: ON (CLOSE) 5: ON (CLOSE) 6: OFF (OPEN)	- - - - - -
	7 : J/SY	ON (CLOSE)	-
	8 : 525/625	DNW-A22: DNW-A22P:	OFF (OPEN) ON (CLOSE)
	S1900 1 – 8: Factory use	OFF (OPEN)	-

\*1, \*2: Never change the switches S101-1 and S101-4.

## For 525/60 system

### Setup menu

**Note** When Bank 1 to 4 menu is recalled, the current menu will be overwritten.

Be sure to check the current menu first, before recall Bank 1 to 4.

- Main menu

#### ITEM-000 series: Operational parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
002: CHARACTER H-POSITION	14					
003: CHARACTER V-POSITION	56					
005: DISPLAY INFORMATION SELECT	T&STA					
007: TAPE TIMER DISPLAY	+/-12H					
009: CHARACTER TYPE	WHITE					
011: CHARACTER V-SIZE	x1					
013*1: 525/625 SYSTEM SELECT	OFF	-	-	-	-	-

\*1: ITEM-013 is no relation with Bank.

#### ITEM-B00 series: Menu bank parameter

This series is not necessary to write down the setting.

B00 series is OFF on the normal state. Set to ON only when ITEM is carried out. After finishing, B00 series return to OFF automatically.

ITEM	Factory setting
B01: RECALL BANK 1	OFF
B02: RECALL BANK 2	OFF
B03: RECALL BANK 3	OFF
B04: RECALL BANK 4	OFF
B11: SAVE BANK 1	OFF
B12: SAVE BANK 2	OFF
B13: SAVE BANK 3	OFF
B14: SAVE BANK 4	OFF
B20: RESET SETUP	OFF

- Extended menu

#### ITEM-100 series: Operational panel parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
101: SELECTION FOR SEARCH DIAL ENABLE	DIAL					
102: MAXIMUM TAPE SPEED	MAX					
104: AUDIO MUTING TIME	OFF					

**ITEM-300 series: Editing parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
320: DIGITAL AUDIO PB PROCESS ON EDIT POINT	FADE					

**ITEM-500 series: Tape protection parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
501: STILL TIMER	8M					

**ITEM-700 series: Video control parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
703: BLANK LINE SELECT						
SUB-ITEM	0: All line	---				
	12: 12 line	BLANK				
	13: 13 line	BLANK				
	14: 14 line	BLANK				
	15: 15 line	BLANK				
	16: 16 line	BLANK				
	17: 17 line	BLANK				
	18: 18 line	BLANK				
	19: 19 line	BLANK				
	20: 20 line	BLANK				
713: VIDEO SETUP REFERENCE LEVEL						
SUB-ITEM	0: MASTER LEVEL	1				
	4: OUTPUT LEVEL	0				

**ITEM-800 series: Audio control parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
802: DIGITAL AUDIO MUTE IN SHUTTLE MODE	OFF					
805: AUDIO MONITOR OUTPUT MIXING	RMS					

**ITEM-F00 series: Adjustment use only**

This series is not necessary to setting.

In the normal operation, use the factory settings.

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
F01: AUDIO NR IN SP MODE	ON					
F02: EMERGENCY TAPE PROTECTION	ENA					
F13: TRACKING CONTROL VIA SEARCH DIAL	OFF					
F16: DEVICE TYPE MODIFY	0					
F34: STOP PINCH OFF TIME	5MIN					

## 625/50 system

### Setup menu

**Note** When Bank 1 to 4 menu is recalled, the current menu will be overwritten.

Be sure to check the current menu first, before recall Bank 1 to 4.

- Main menu

#### ITEM-000 series: Operational parameter

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
002: CHARACTER H-POSITION	12					
003: CHARACTER V-POSITION	6A					
005: DISPLAY INFORMATION SELECT	T&STA					
007: TAPE TIMER DISPLAY	+/-12H					
009: CHARACTER TYPE	WHITE					
011: CHARACTER V-SIZE	x1					
013*1: 525/625 SYSTEM SELECT	OFF	-	-	-	-	-

\*1: ITEM-013 is no relation with Bank.

#### ITEM-B00 series: Menu bank parameter

This series is not necessary to write down the setting.

B00 series is OFF on the normal state. Set to ON only when ITEM is carried out. After finishing, B00 series return to OFF automatically.

ITEM	Factory setting
B01: RECALL BANK 1	OFF
B02: RECALL BANK 2	OFF
B03: RECALL BANK 3	OFF
B04: RECALL BANK 4	OFF
B11: SAVE BANK 1	OFF
B12: SAVE BANK 2	OFF
B13: SAVE BANK 3	OFF
B14: SAVE BANK 4	OFF
B20: RESET SETUP	OFF

- Extended menu

**ITEM-100 series: Operational panel parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
101: SELECTION FOR SEARCH DIAL ENABLE	DIAL					
102: MAXIMUM TAPE SPEED	MAX					
104: AUDIO MUTING TIME	OFF					

**ITEM-300 series: Editing parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
320: DIGITAL AUDIO PB PROCESS ON EDIT POINT	FADE					

**ITEM-500 series: Tape protection parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
501: STILL TIMER	8M					

**ITEM-700 series: Video control parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
703: BLANK LINE SELECT						
SUB-ITEM	0: All line	---				
	9: 9,322 line	BLANK				
	10: 10,323 line	BLANK				
	11: 11,324 line	BLANK				
	12: 12,325 line	BLANK				
	13: 13,326 line	BLANK				
	14: 14,327 line	BLANK				
	15: 15,328 line	BLANK				
	16: 16,329 line	BLANK				
	17: 17,330 line	BLANK				
	18: 18,331 line	BLANK				
	19: 19,332 line	BLANK				
	20: 20,333 line	BLANK				
	21: 21,334 line	BLANK				
	22: 22,335 line	BLANK				
	23: 23 line	HALF				

**ITEM-800 series: Audio control parameter**

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
802: DIGITAL AUDIO MUTE IN SHUTTLE MODE	OFF					
805: AUDIO MONITOR OUTPUT MIXING	RMS					

**ITEM-F00 series: Adjustment use only**

This series is not necessary to setting.

In the normal operation, use the factory settings.

ITEM	Factory setting	Current	Bank 1	Bank 2	Bank 3	Bank 4
F01: AUDIO NR IN SP MODE	ON					
F02: EMERGENCY TAPE PROTECTION	ENA					
F13: TRACKING CONTROL VIA SEARCH DIAL	OFF					
F16: DEVICE TYPE MODIFY	0					
F34: STOP PINCH OFF TIME	5MIN					

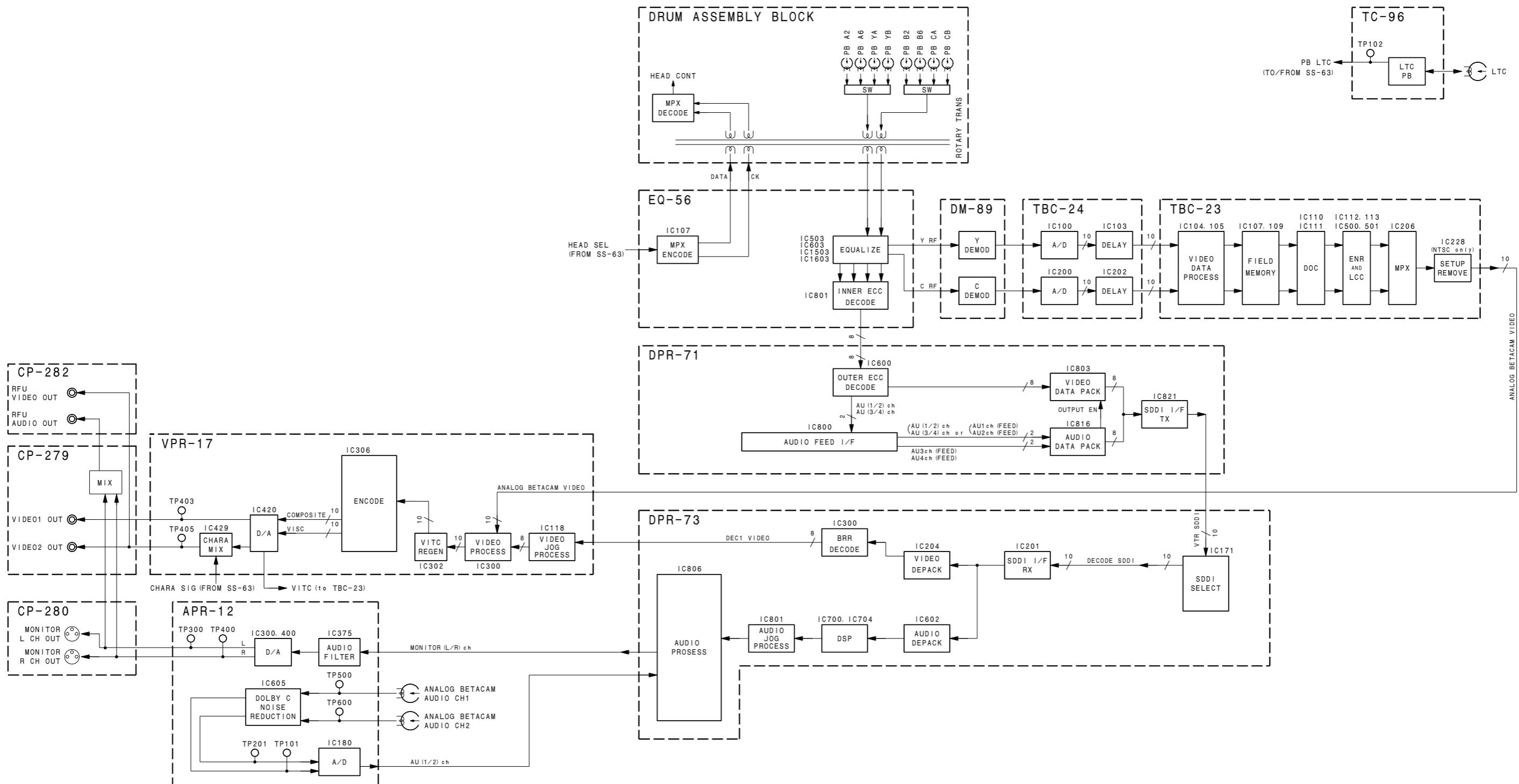
## **Appendix B**

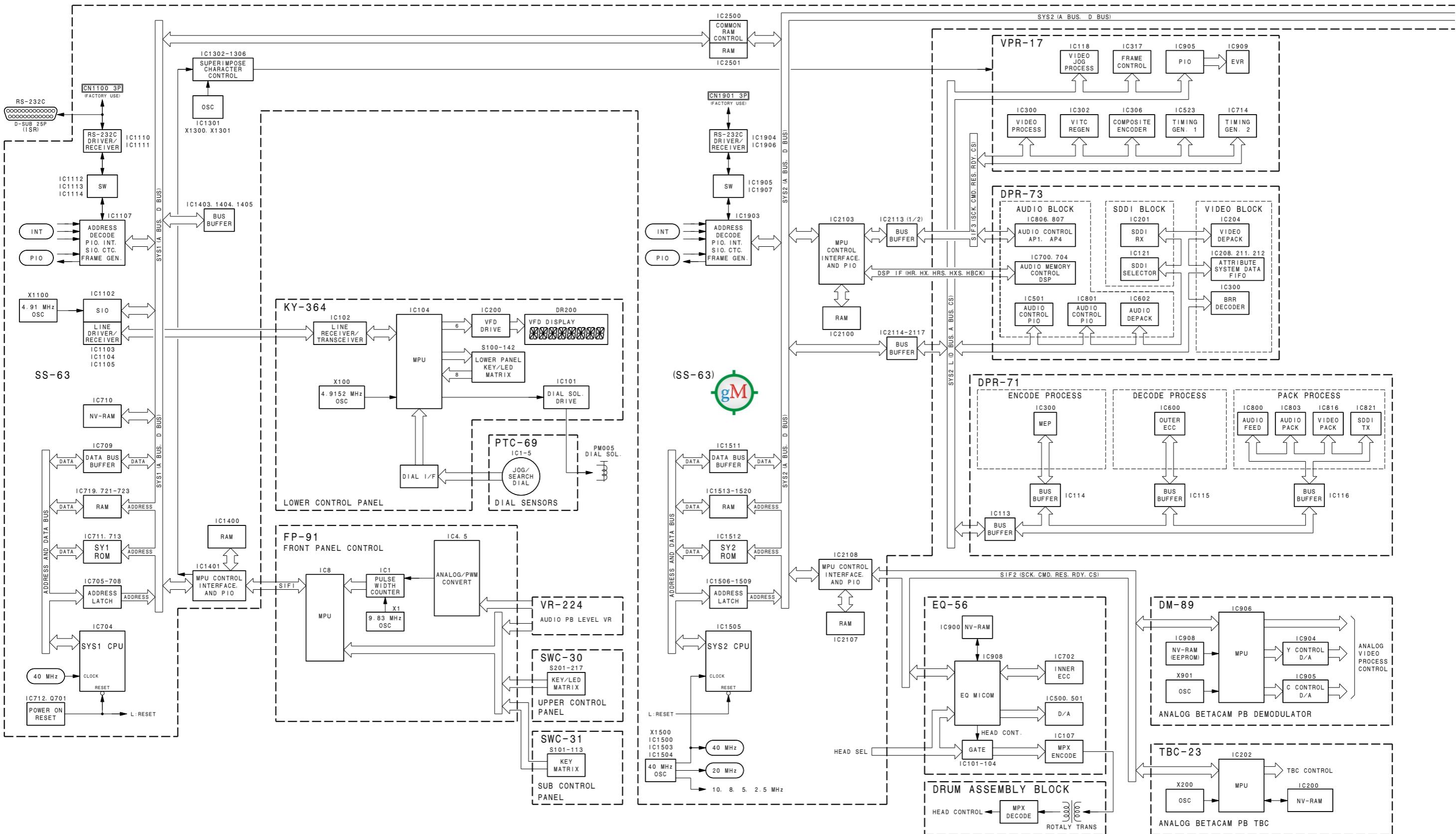
### **Block Diagrams**

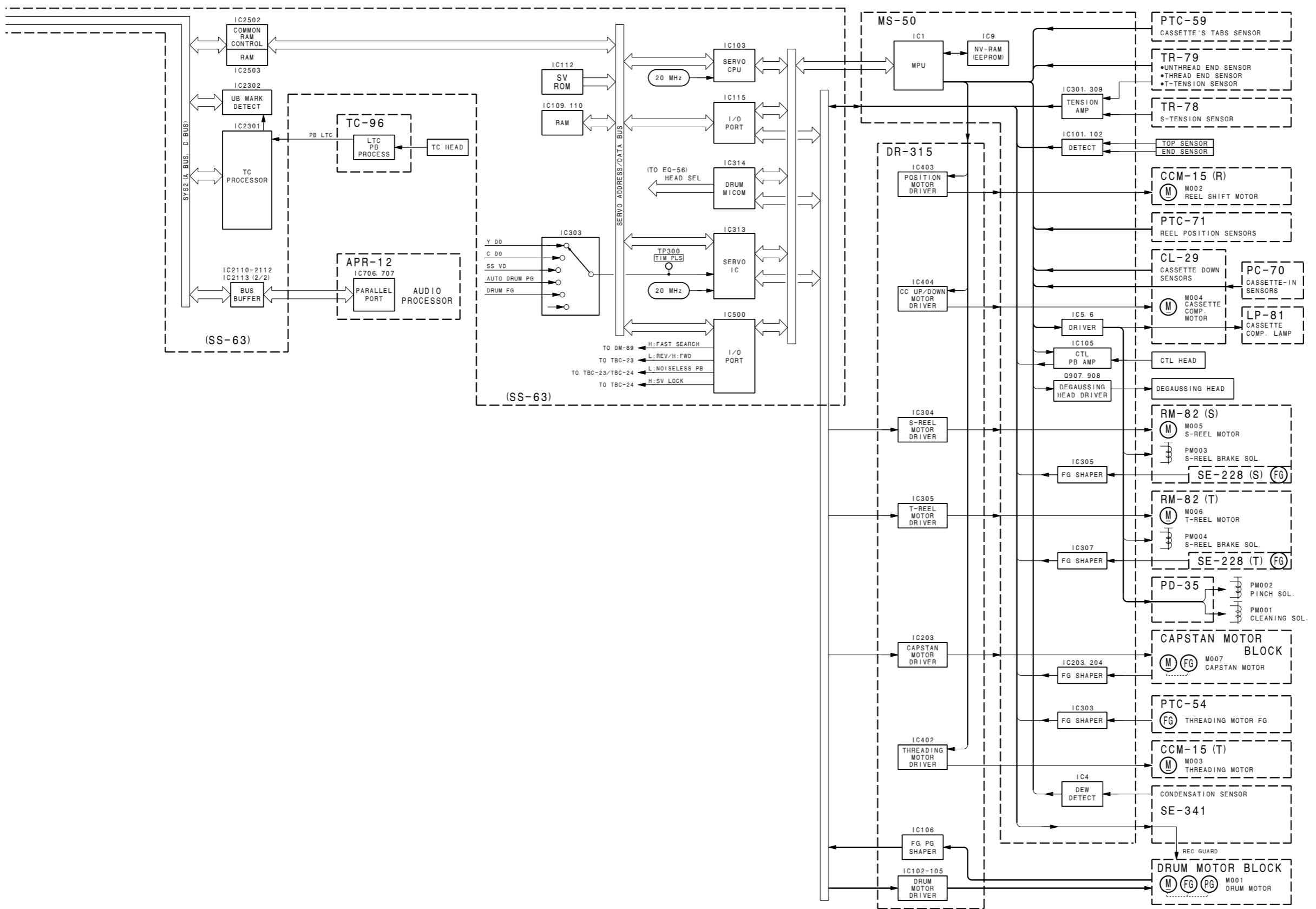
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## For the U.S.A. and Canada

### SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

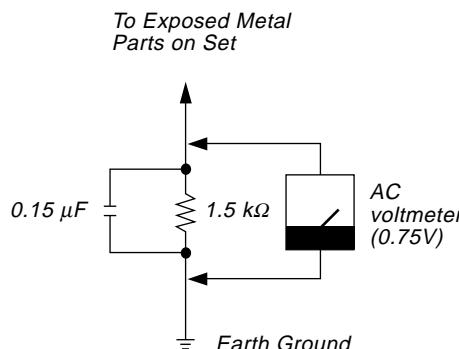


Fig A. Using an AC voltmeter to check AC leakage.

DNW-A22 (SY)  
DNW-A22P (SY) E  
3-193-847-02

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